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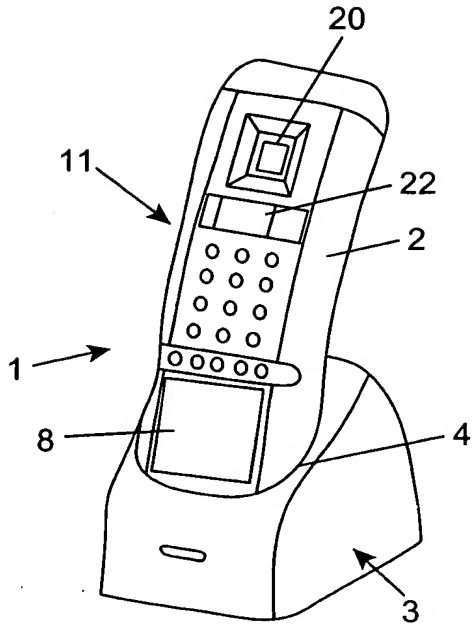

FIG. 1A

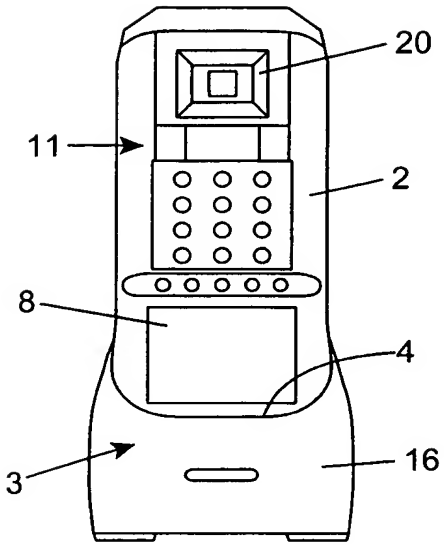

FIG. 1B

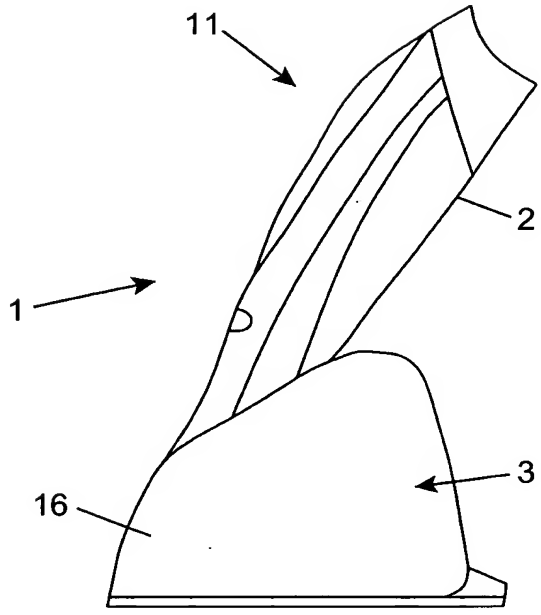

FIG. 1C

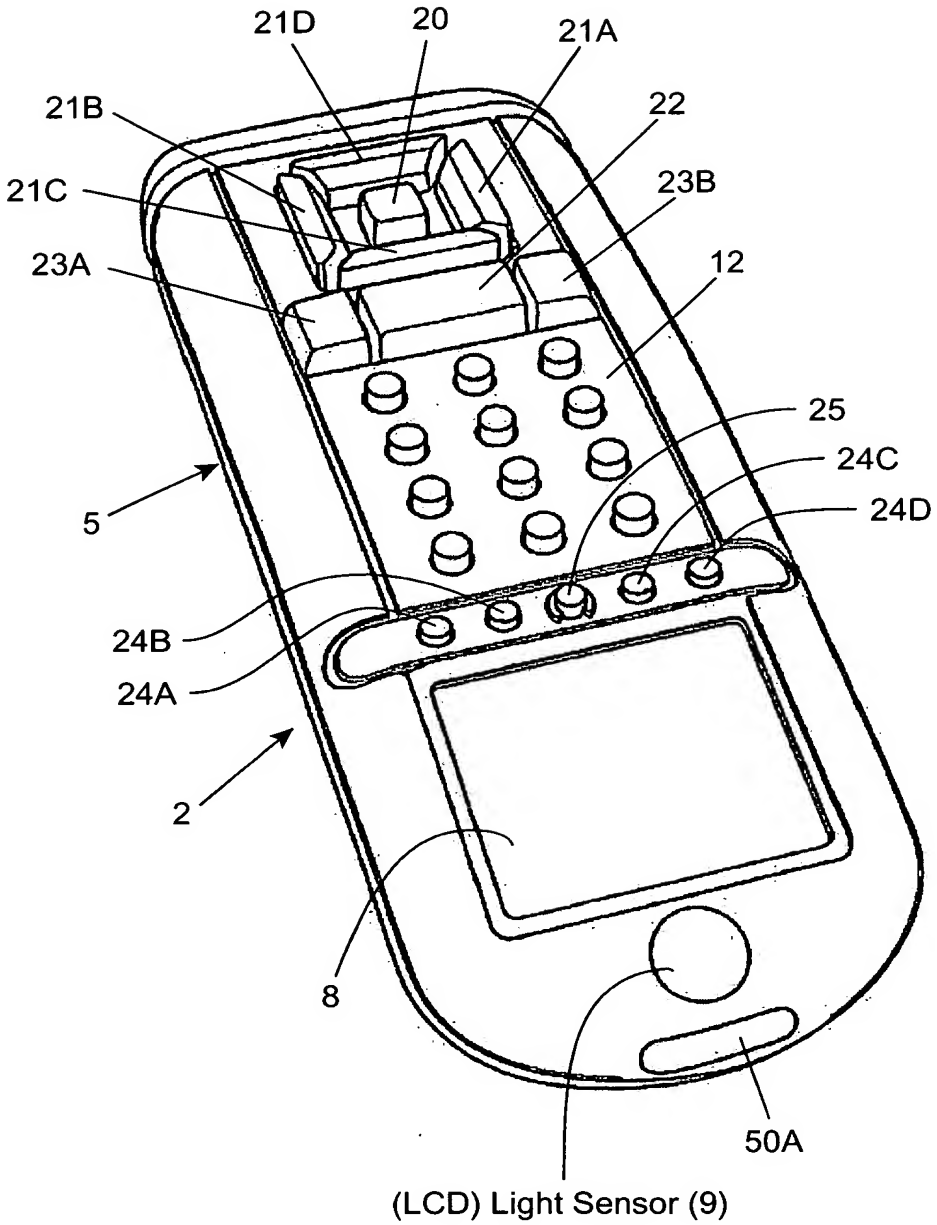
21D
20
21A
21B
22
21C
23B
23A
12
25
24C
24D
5
24B
24A
2
8
50A
(LCD) Light Sensor (9)

FIG. 2A

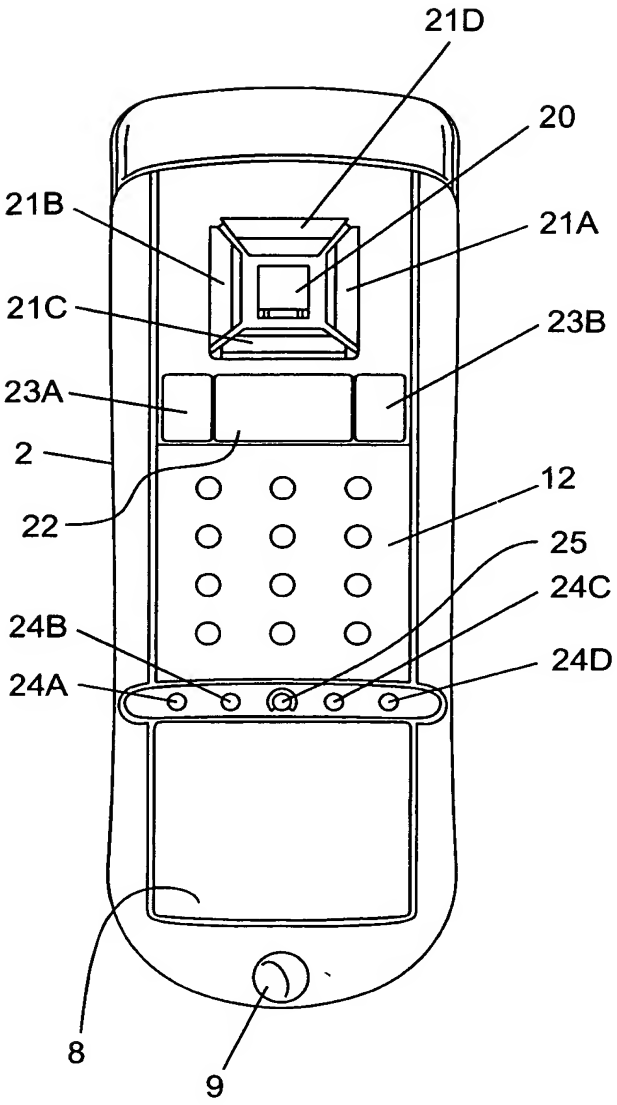

FIG. 2B1

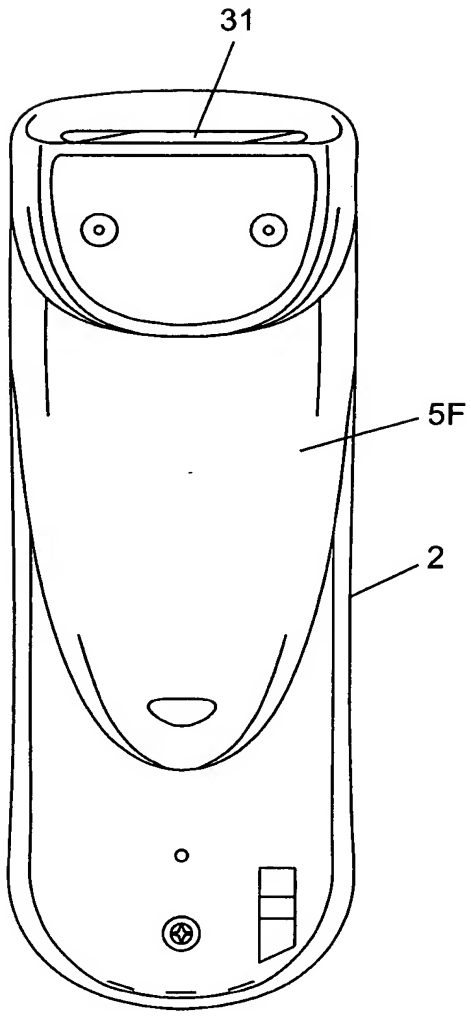

FIG. 2B2

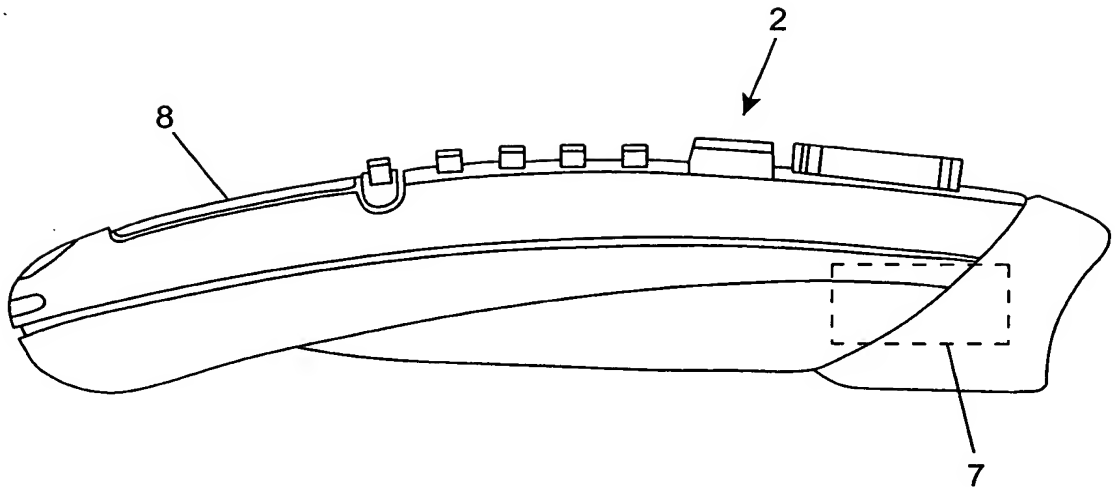

FIG. 2C1

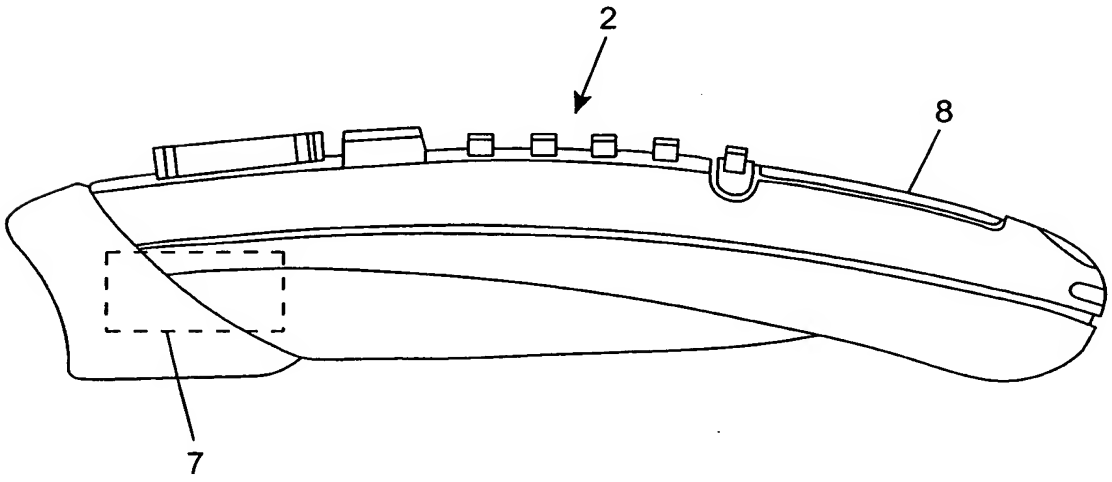

FIG. 2C2

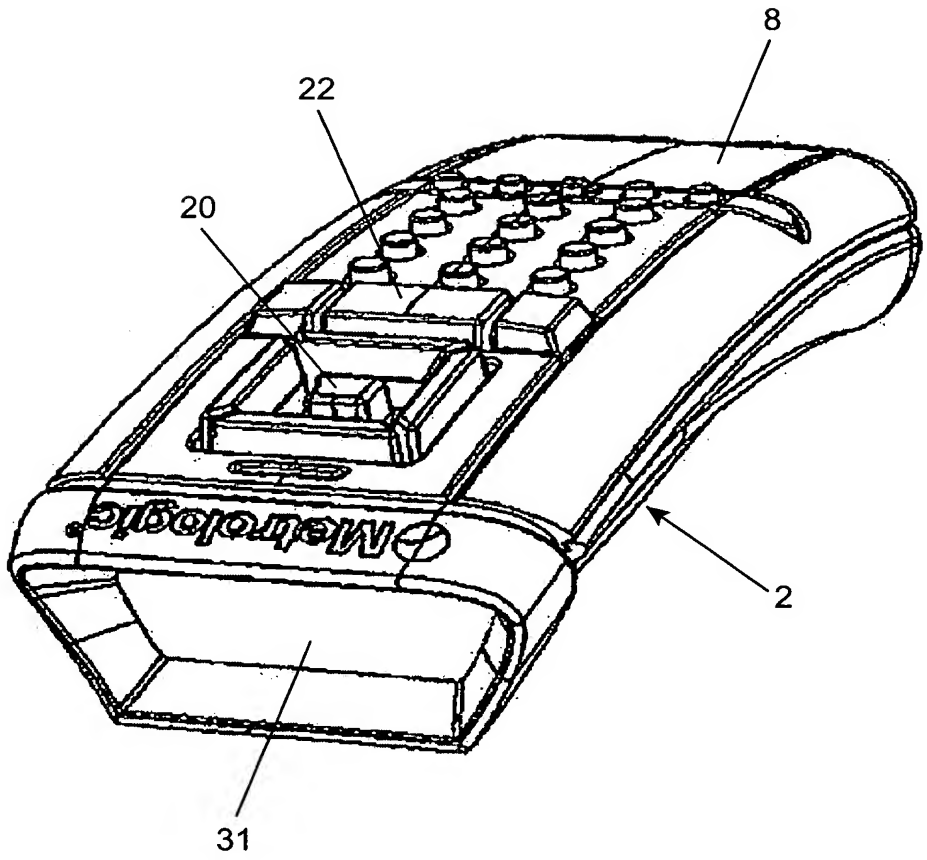

FIG. 2D

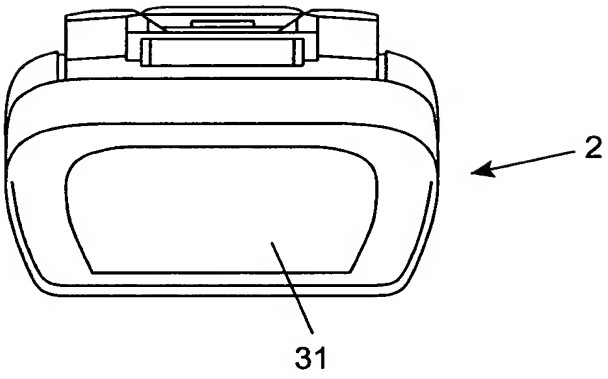

FIG. 2E1

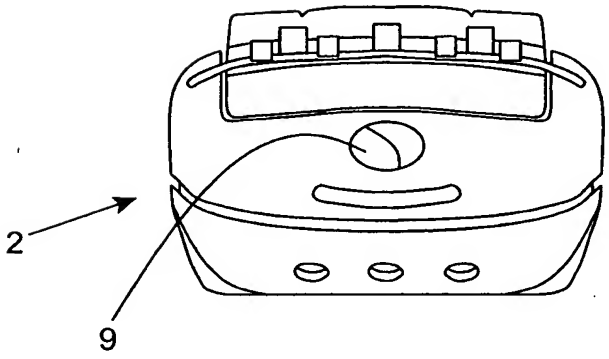

FIG. 2E2

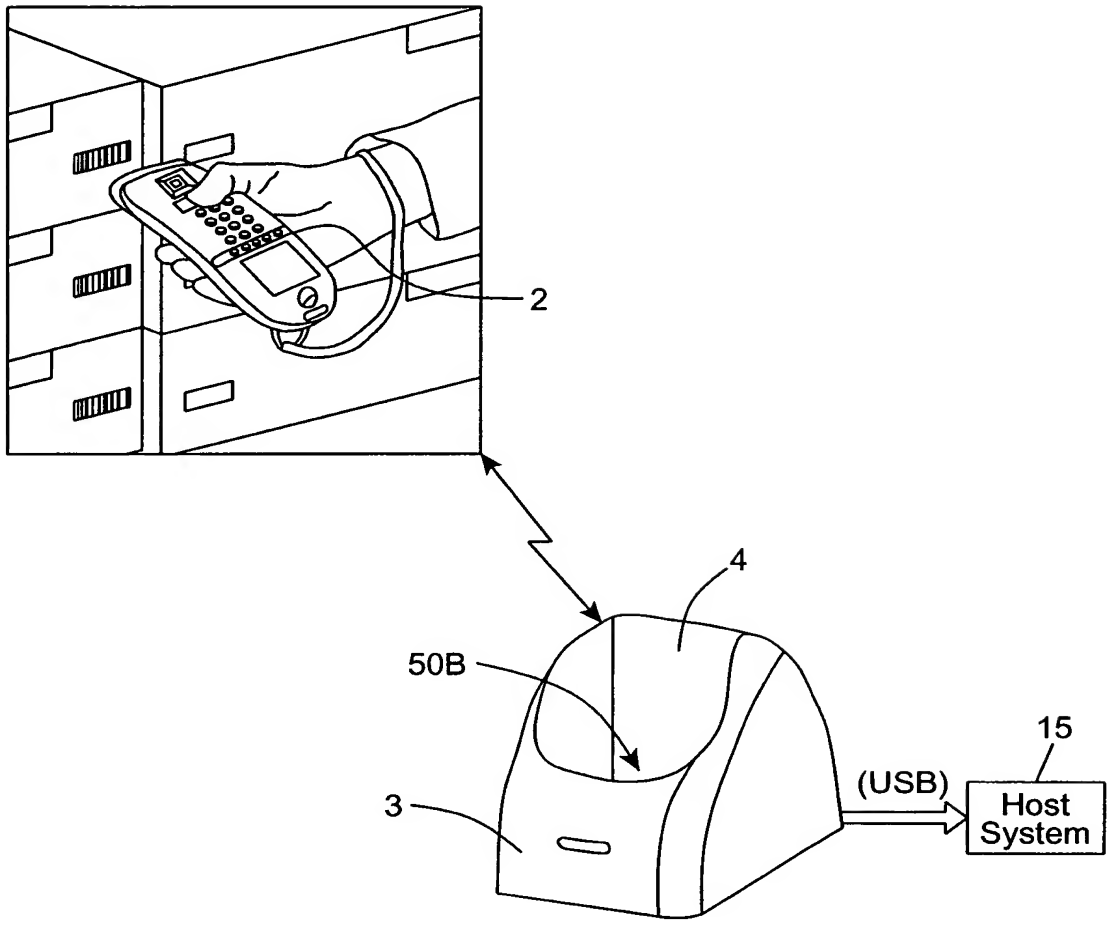

FIG. 3

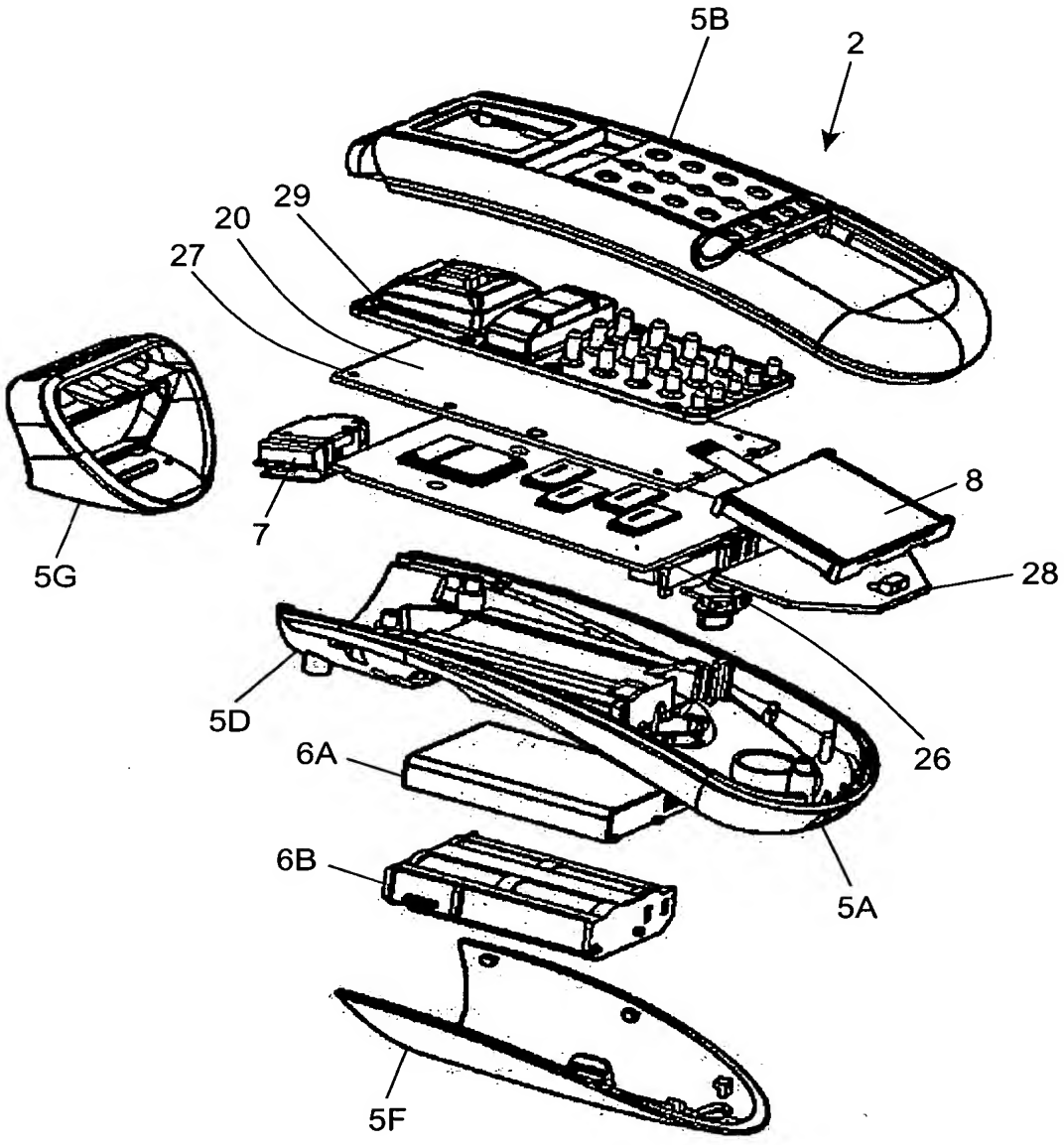

FIG. 4

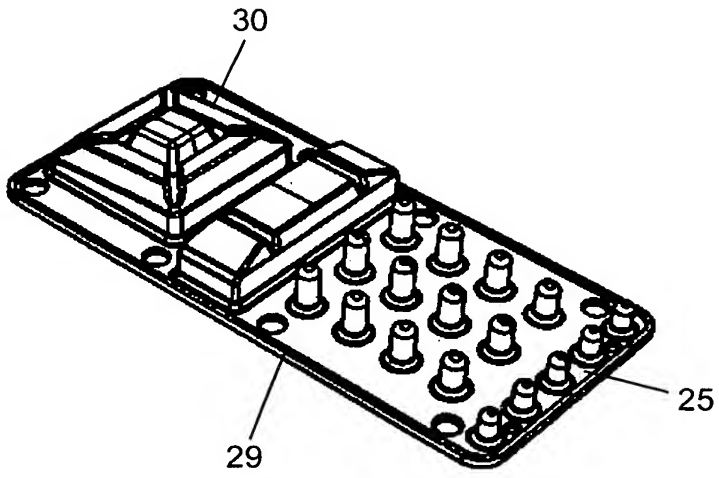
30
25
29

FIG. 5A

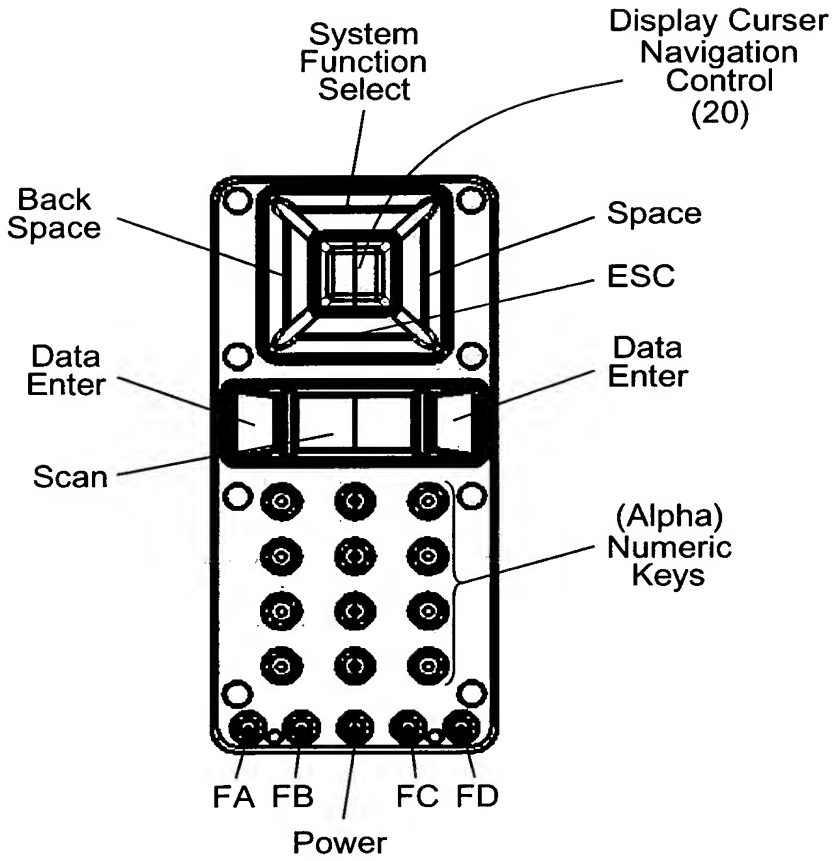
System Function Select
Display Curser Navigation Control (20)
Back Space
Space
ESC
Data Enter
Data Enter
Scan
(Alpha) Numeric Keys
FA
FB
FC
FD
Power

FIG. 5B

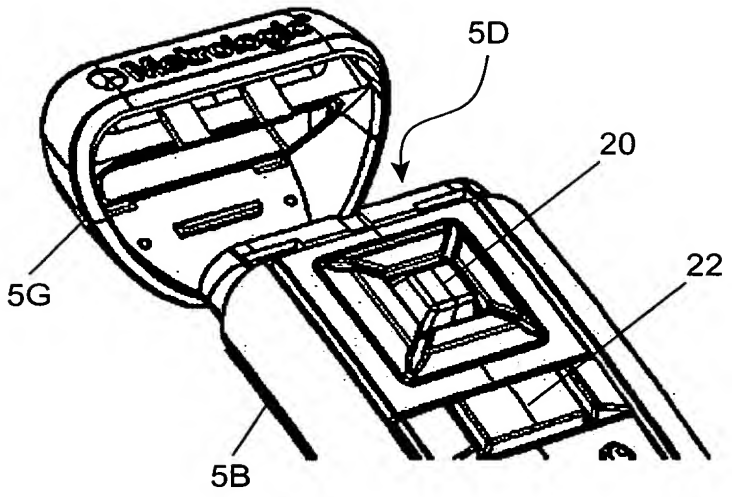

FIG. 5C

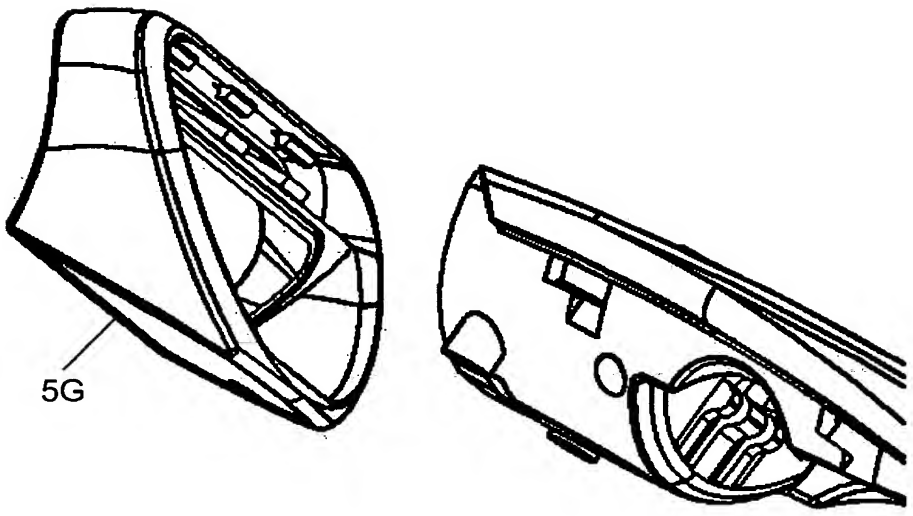

FIG. 5D

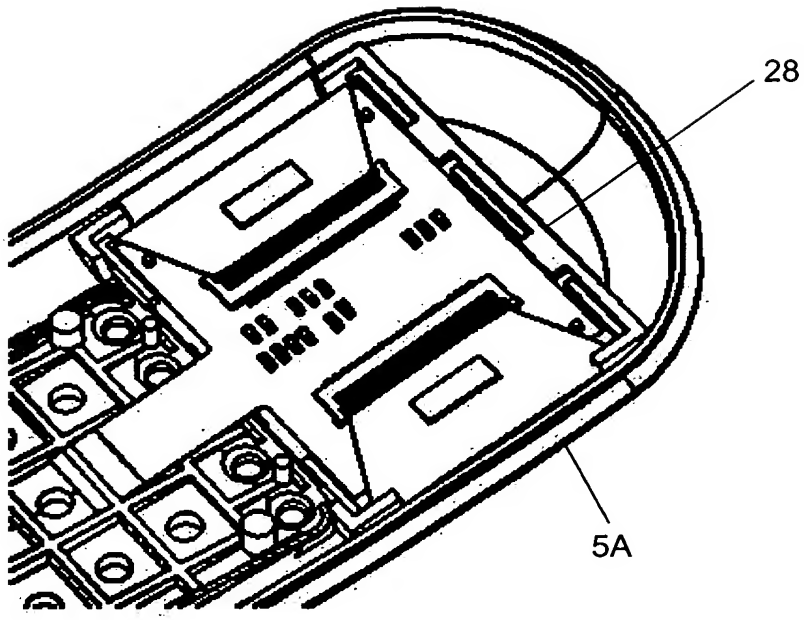

FIG. 5E

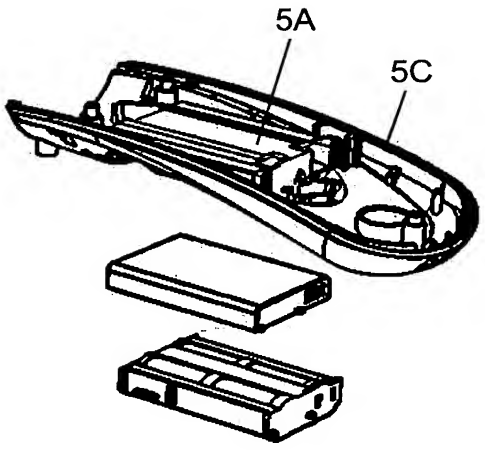

FIG. 5F

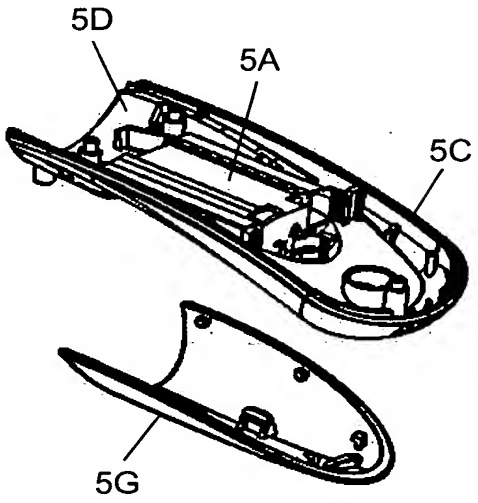

FIG. 5G

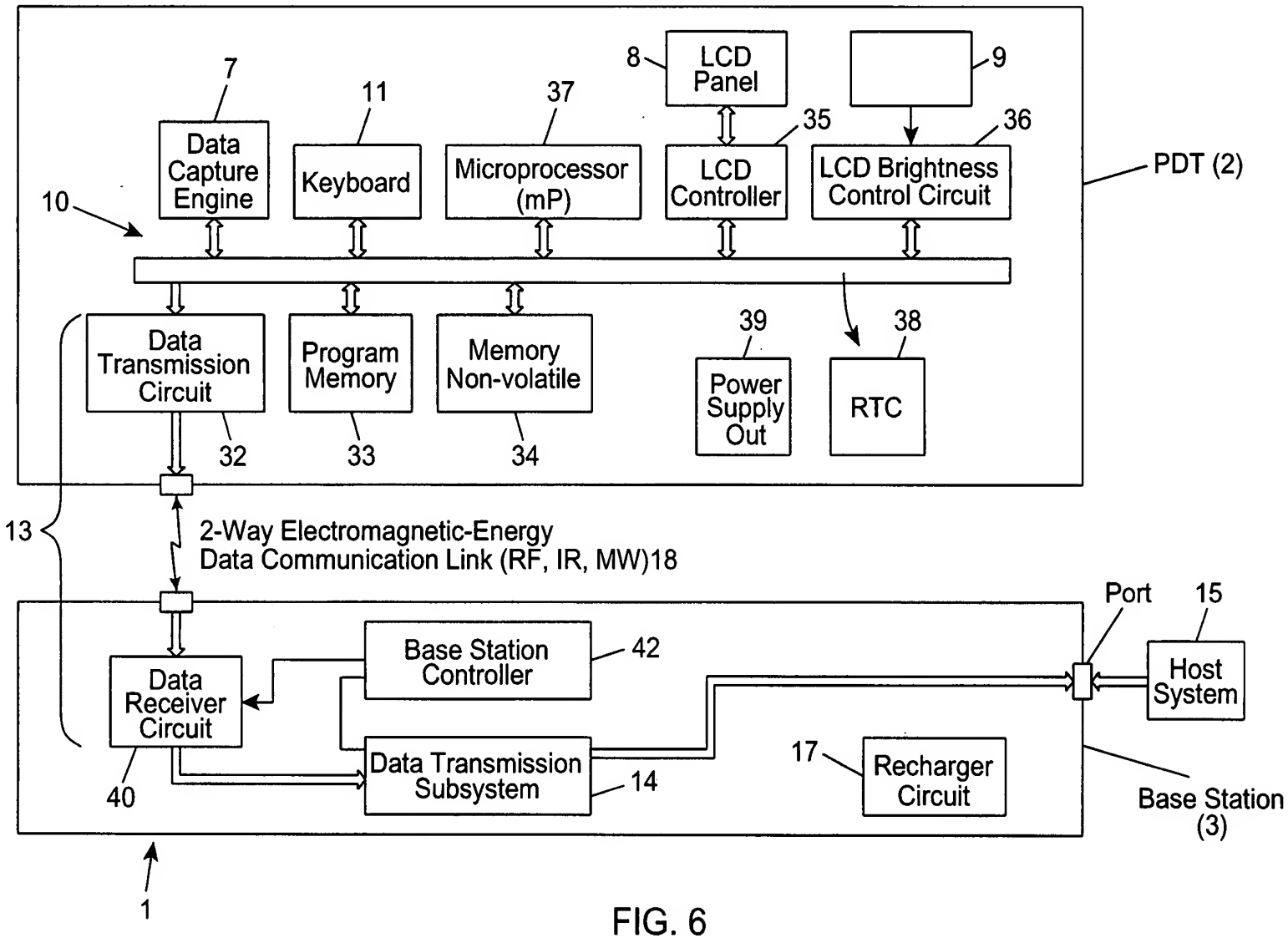
7
Data Capture Engine
11
Keyboard
37
Microprocessor (mP)
8
LCD Panel
9
35
LCD Controller
36
LCD Brightness Control Circuit
PDT (2)
10
Data Transmission Circuit
32
Program Memory
33
Memory Non-volatile
34
39
Power Supply Out
38
RTC
13
2-Way Electromagnetic-Energy Data Communication Link (RF, IR, MW)18
Port
15
Host System
Base Station Controller
42
Data Receiver Circuit
40
Data Transmission Subsystem
14
17
Recharger Circuit
Base Station (3)
1

FIG. 6

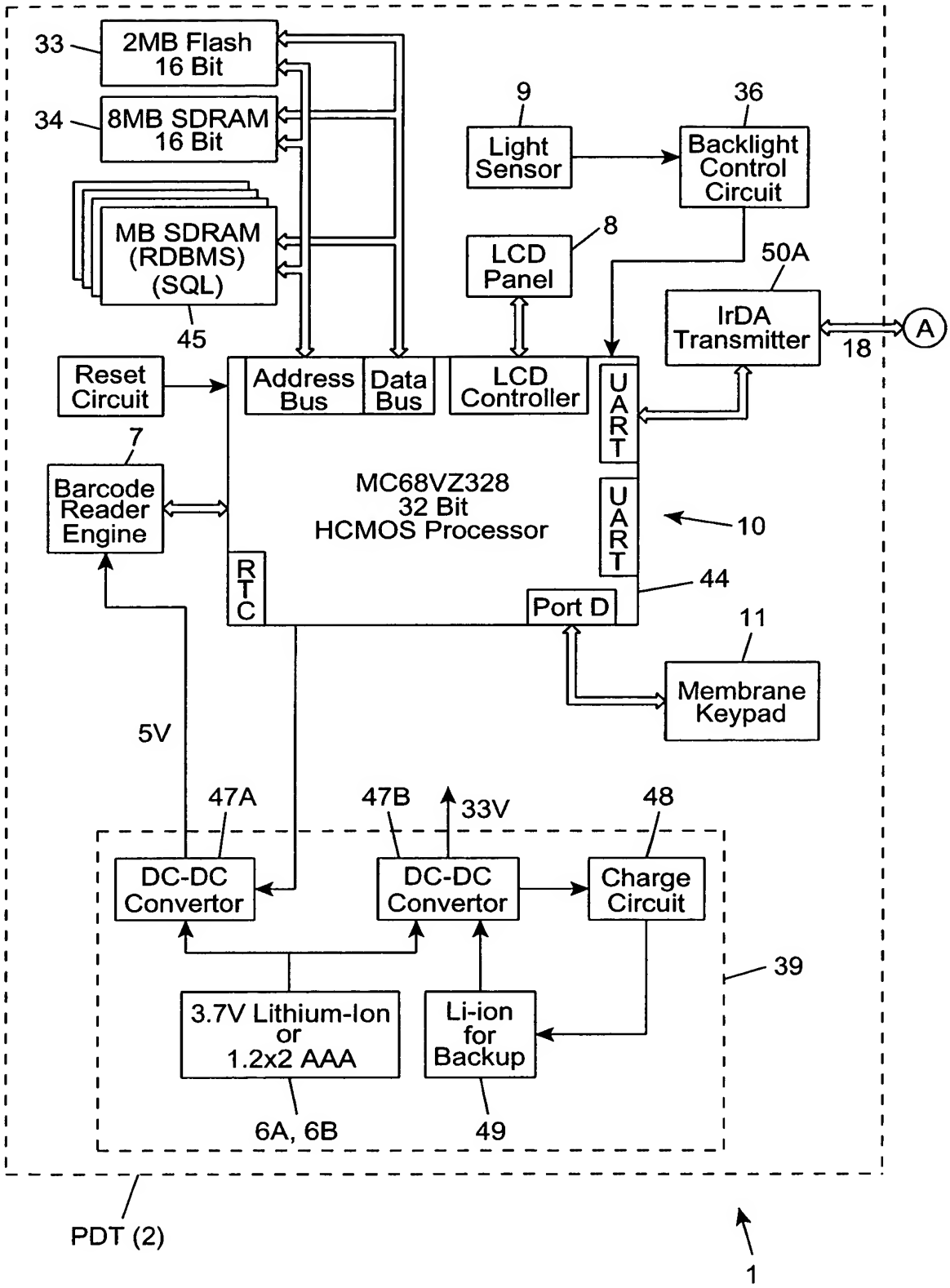
33
2MB Flash 16 Bit
34
8MB SDRAM 16 Bit
MB SDRAM (RDBMS) (SQL)
45
9
Light Sensor
36
Backlight Control Circuit
8
LCD Panel
50A
IrDA Transmitter
18
A
Reset Circuit
Address Bus
Data Bus
LCD Controller
UART
UART
7
Barcode Reader Engine
MC68VZ328
32 Bit
HCMOS Processor
10
RTC
44
Port D
11
Membrane Keypad
5V
47A
47B
33V
48
DC-DC Convertor
DC-DC Convertor
Charge Circuit
39
3.7V Lithium-Ion or 1.2x2 AAA
Li-ion for Backup
6A, 6B
49
PDT (2)
1

FIG. 7A

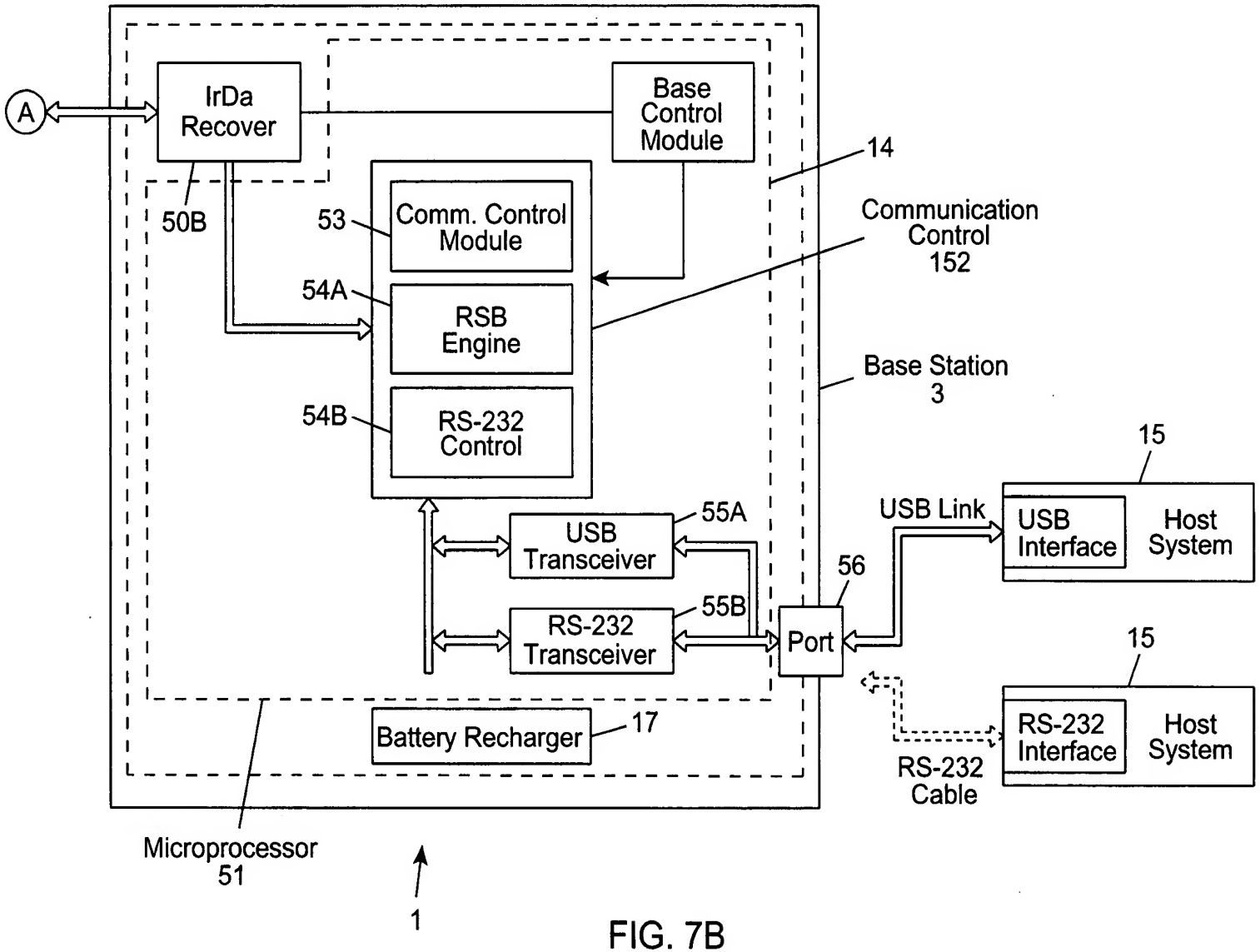
A
IrDa Recover
Base Control Module
14
50B
53
Comm. Control Module
Communication Control 152
54A
RSB Engine
Base Station 3
54B
RS-232 Control
15
USB Link
USB Interface
Host System
55A
USB Transceiver
56
55B
RS-232 Transceiver
Port
15
Battery Recharger
17
RS-232 Interface
Host System
RS-232 Cable
Microprocessor 51
1

FIG. 7B

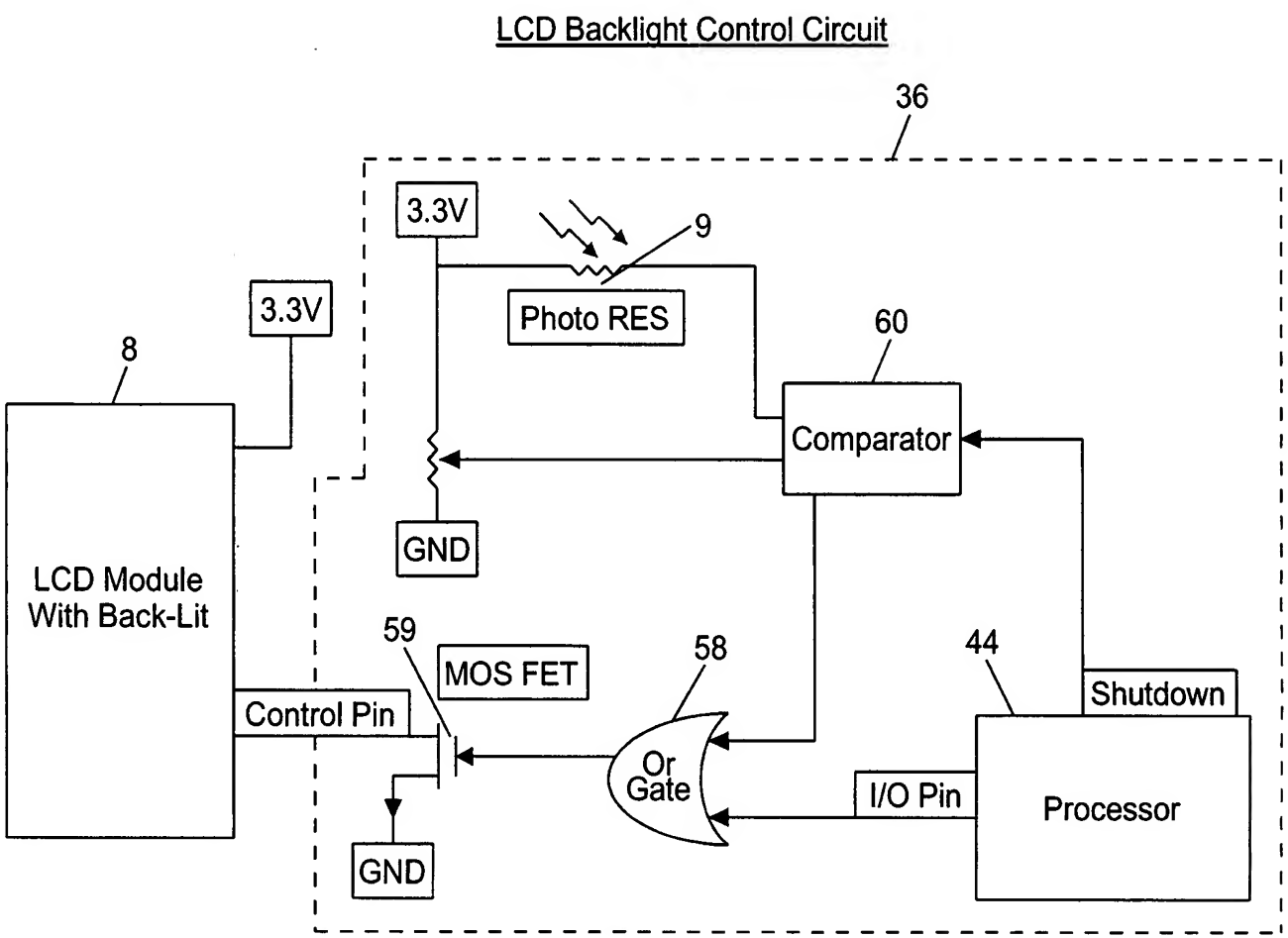
LCD Backlight Control Circuit
36
3.3V
9
Photo RES
3.3V
8
60
Comparator
LCD Module
With Back-Lit
GND
59
MOS FET
58
44
Shutdown
Control Pin
Or
Gate
I/O Pin
Processor
GND

FIG. 8

Software Block Diagram

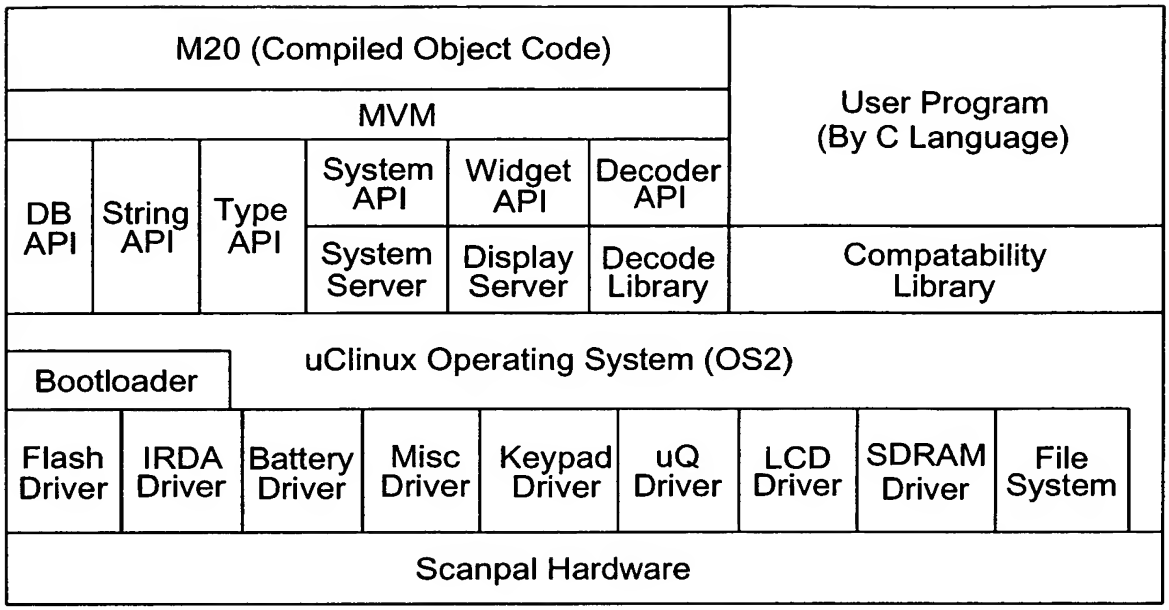

FIG. 9A

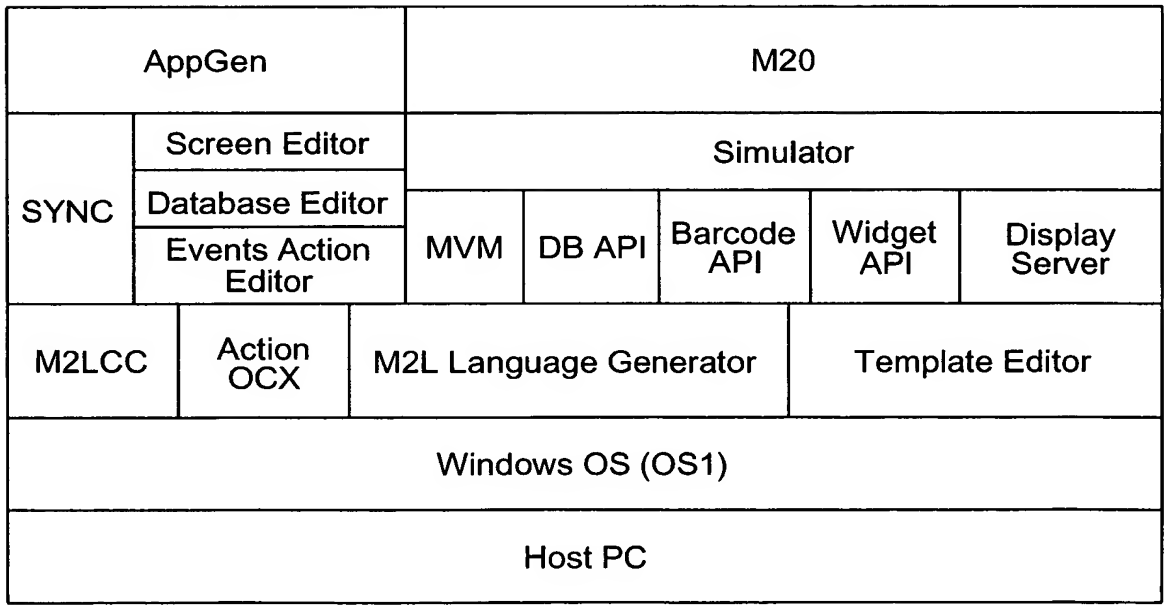

FIG. 9B

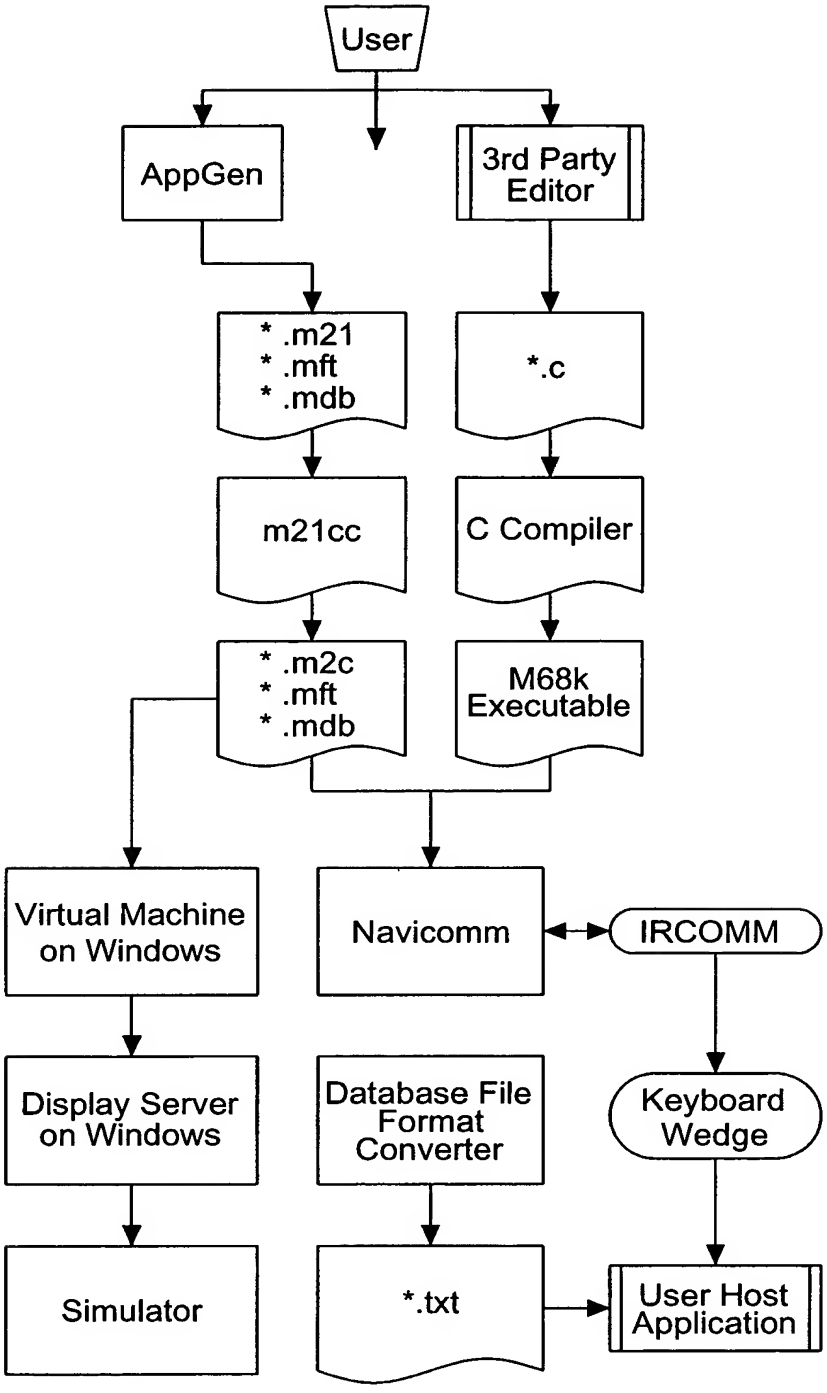
User
AppGen
3rd Party Editor
* .m21
* .mft
* .mdb
*.c
m21cc
C Compiler
* .m2c
* .mft
* .mdb
M68k Executable
Virtual Machine on Windows
Navicomm
IRCOMM
Display Server on Windows
Database File Format Converter
Keyboard Wedge
Simulator
*.txt
User Host Application

FIG. 10A1

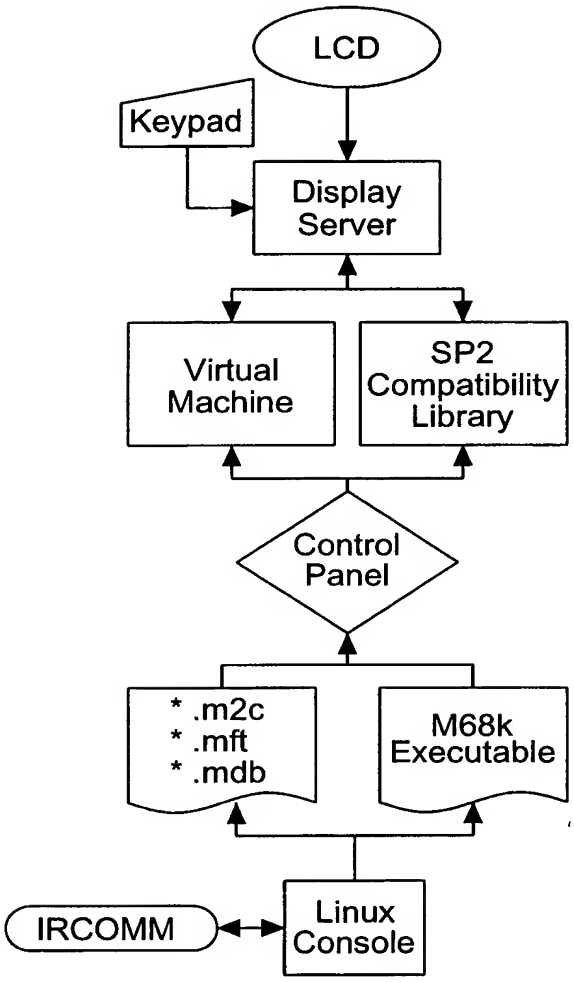
LCD
Keypad
Display Server
Virtual Machine
SP2 Compatibility Library
Control Panel
* .m2c
* .mft
* .mdb
M68k Executable
IRCOMM
Linux Console

FIG. 10A2

•What is AppGen made up with?

1. "Screen Layout Design" Module or "Screen Editor"
2. "Screen Action Design" Module or "Action Designer"
3. "System Information" Module

•Screen Editor

1. Screen Structure Tree

```
Screen Object
|
|__Main Screen Object
|                |__Static Labels, Variable Labels
|                |__Menus
|                |__Input Areas
|                |__Images
|                |__Shapes
|                |__Animations
|
|__Overlay Area Objects
|                |__Top Aligned
|                |        |__Static Labels, Variable Labels
|                |        |__Images
|                |        |__Shapes
|                |        |__Animations
|                |
|                |__Left Aligned
|                |        |__....
|                |
|                |__Right Aligned
|                |        |__....
|                |
|                |__Bottom Aligned
|                         |__....
|
|__Message Window Objects
                 |__Static Labels, Variable Labels
                 |__Images
                 |__Shapes
                 |__Animations
```

FIG. 10B1

2. Screen Widgets

1) Static Labels
2) Variable Labels
3) Menus
4) Input Areas
5) Images, Shapes, Animations
6) Variable Object *

3. How does Screen Editor work?

1) Enlarged Placement Pad
2) Real-Size Preview Pad
3) What you see is what you get

• Action Designer

1. What are actions for?

2. When can actions be defined?

1) Before entering a specific Screen Object
2) Before leaving a specific Screen Object
3) After a data collection is finished

3. What actions are covered?

1) Database Operation
Lookup, insert, delete, update...

2) Data Formatting

3) Message Window Display

4) Communication

5) Beep, restart, reboot...

4. Who can have actions?

1) Main Screen Object
2) Input Area Widget

FIG. 10B2

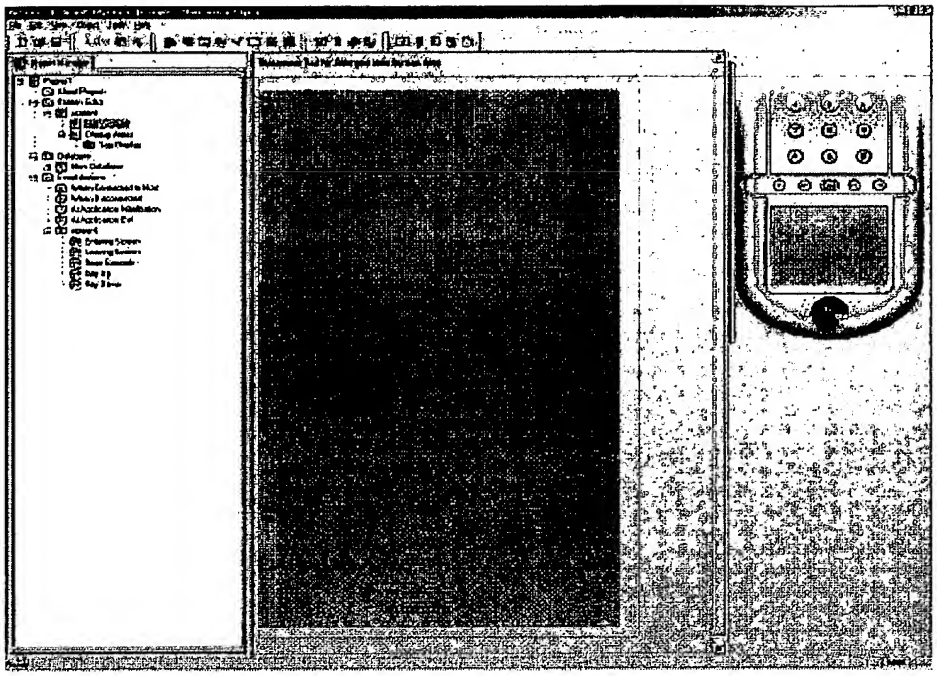

FIG. 10C1

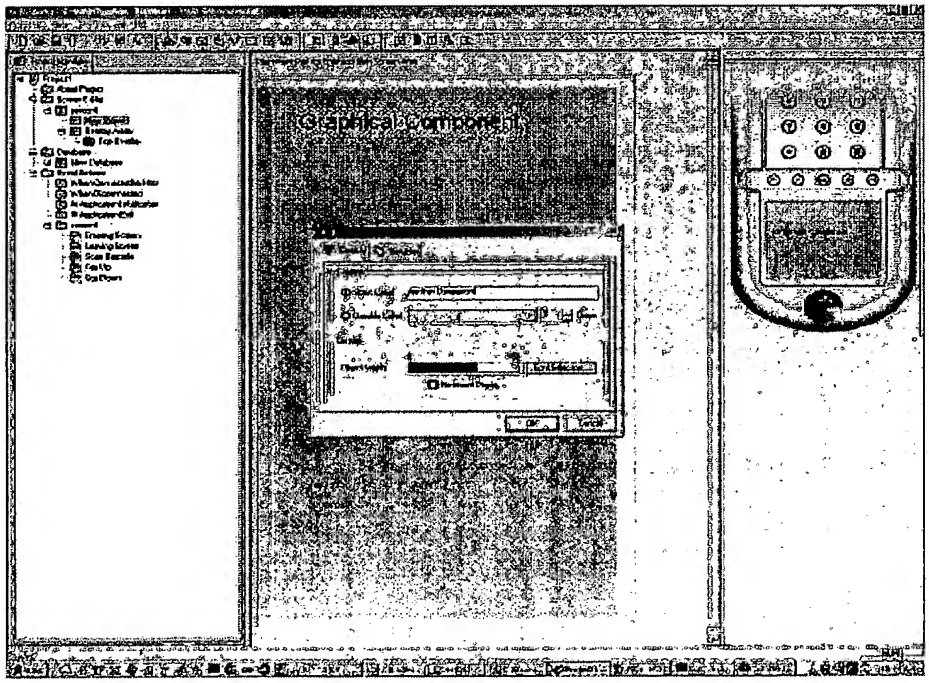

FIG. 10C2

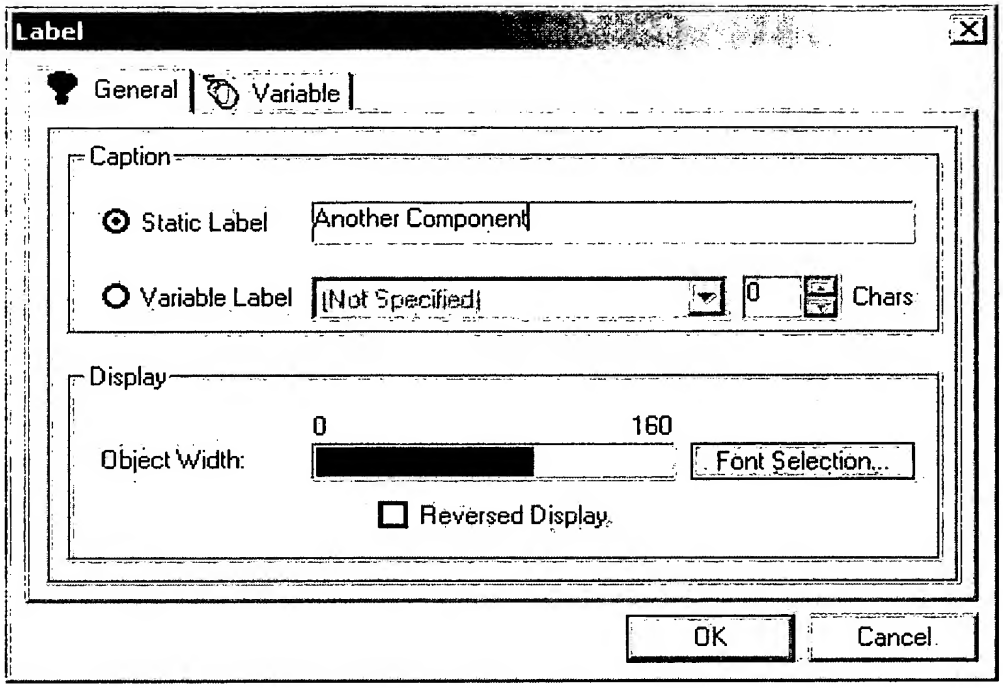

FIG. 10C3

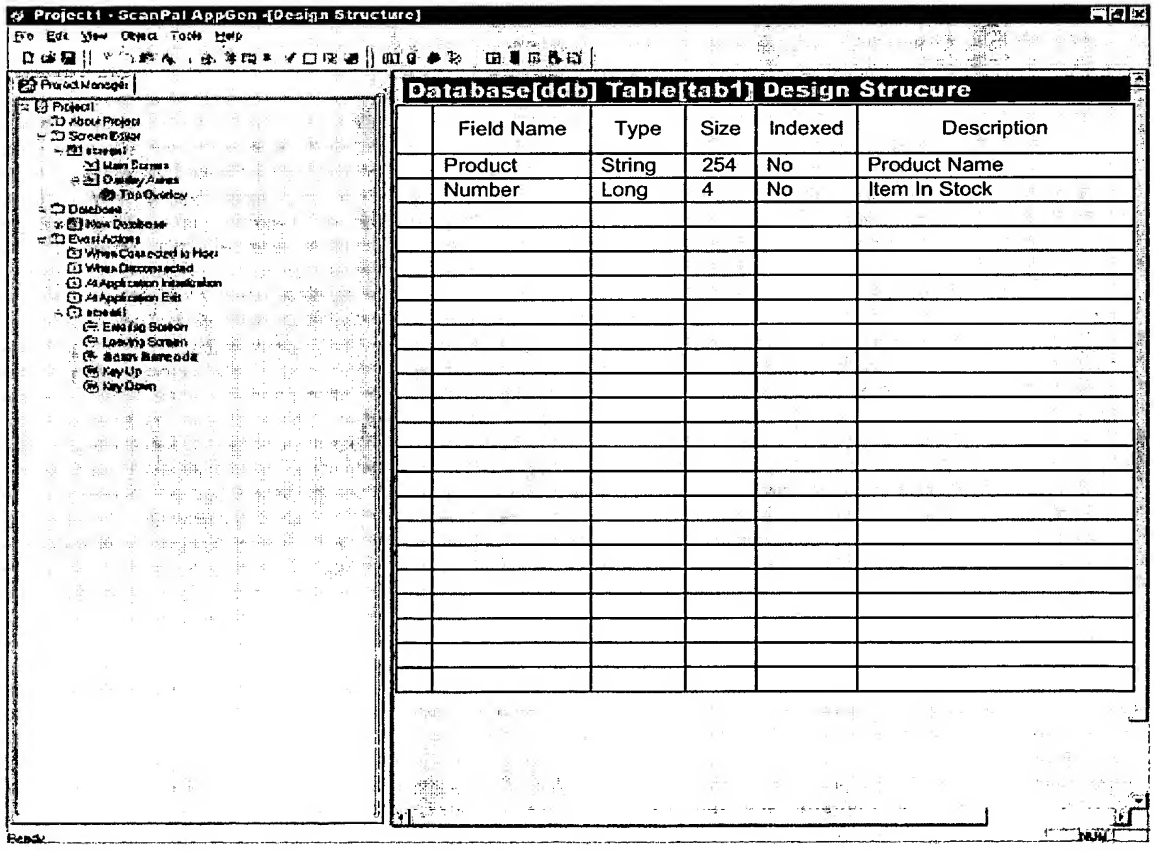

FIG. 10C4

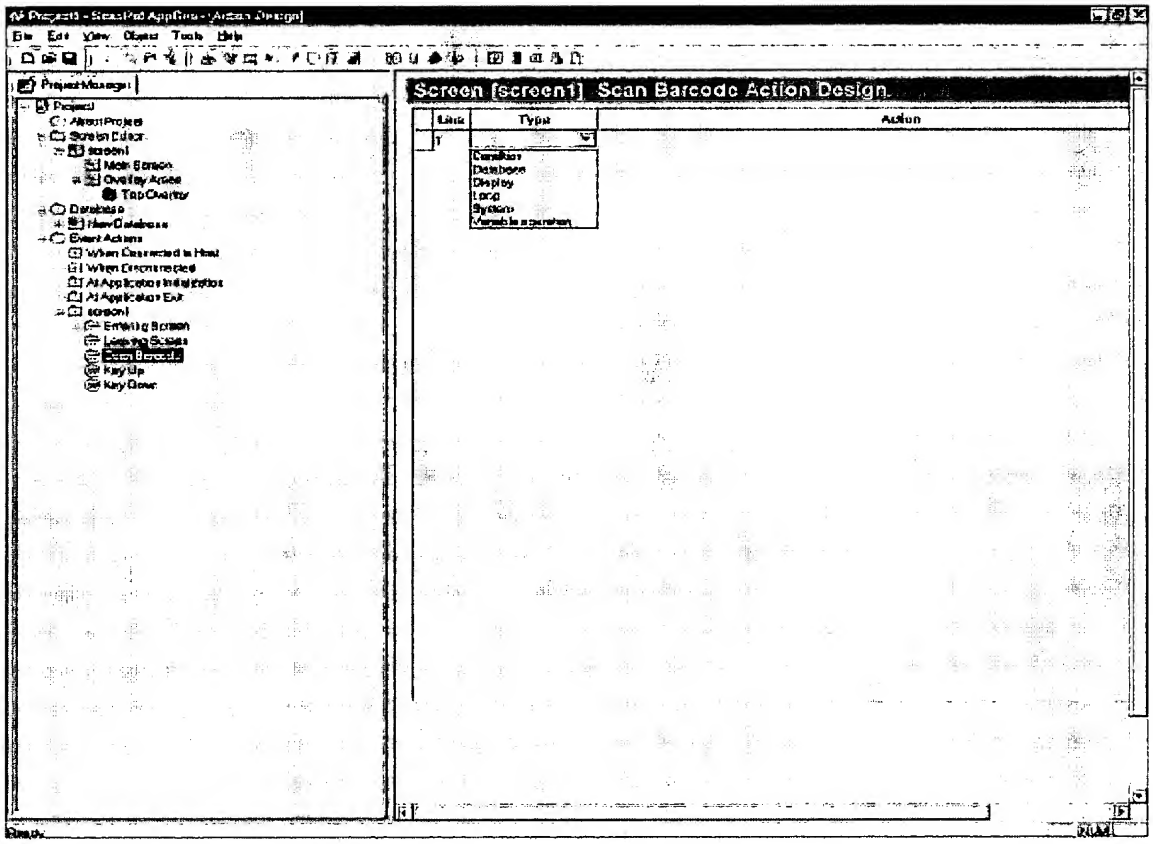

FIG. 10C5

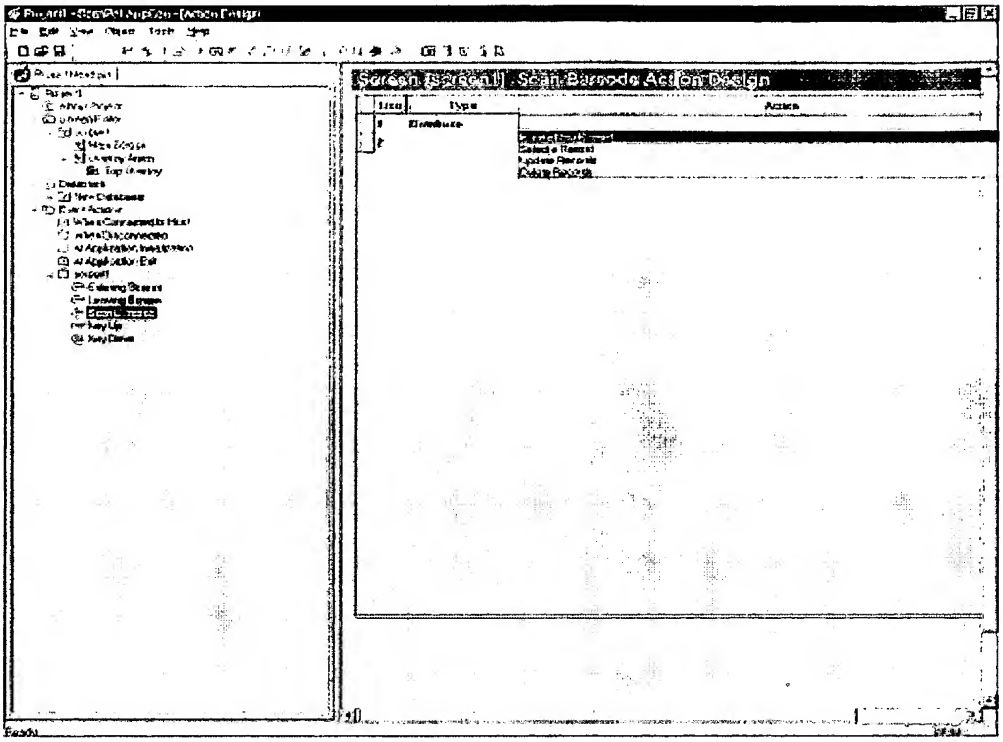

FIG. 10C6

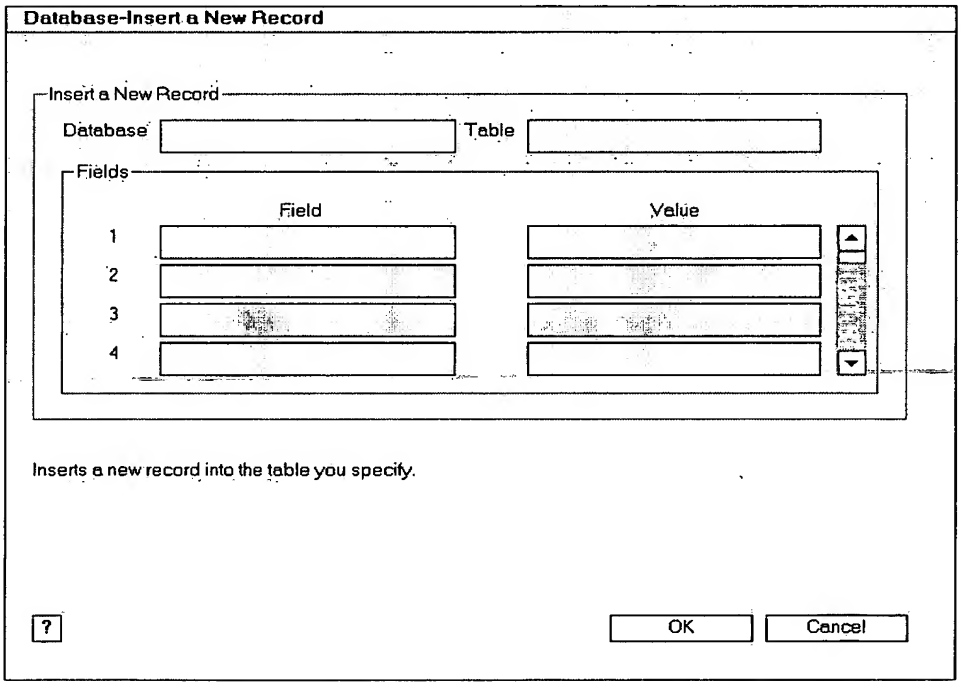

FIG. 10C7

Display Screen From Simulator Module

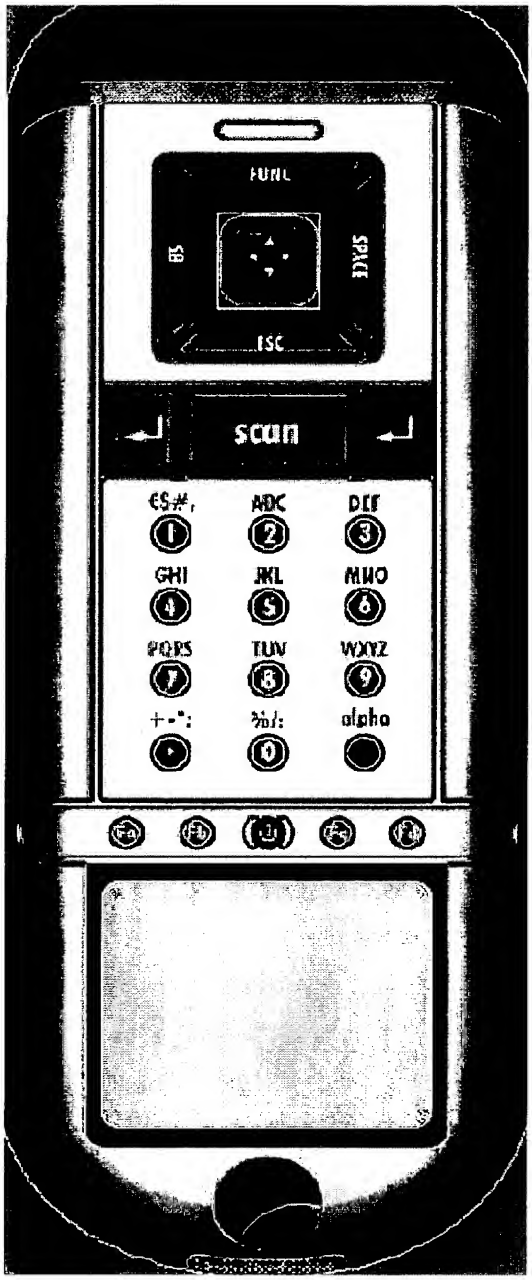

FIG. 10C8

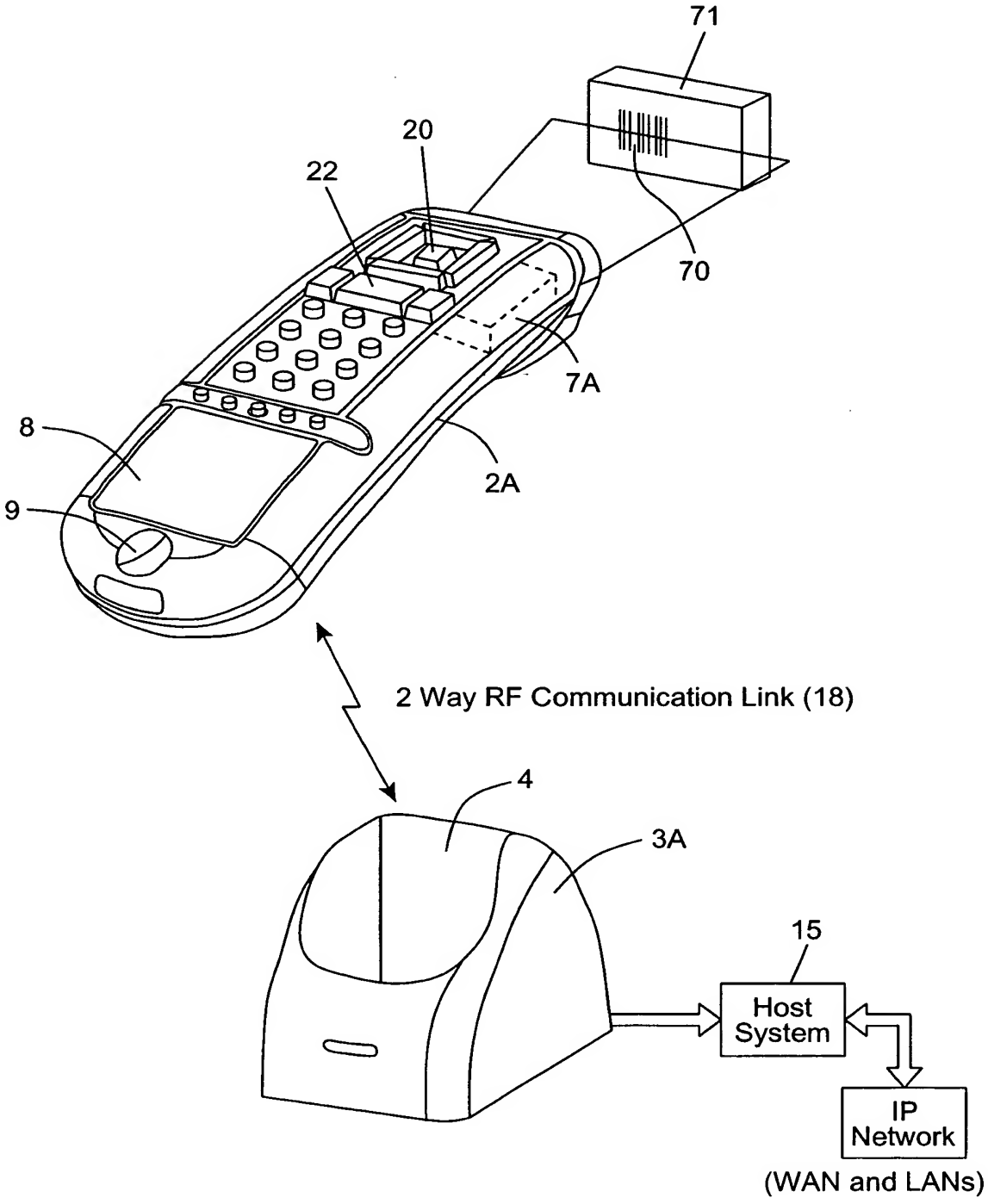
71
20
22
70
7A
8
2A
9
2 Way RF Communication Link (18)
4
3A
15
Host System
IP Network
(WAN and LANs)

FIG. 11A

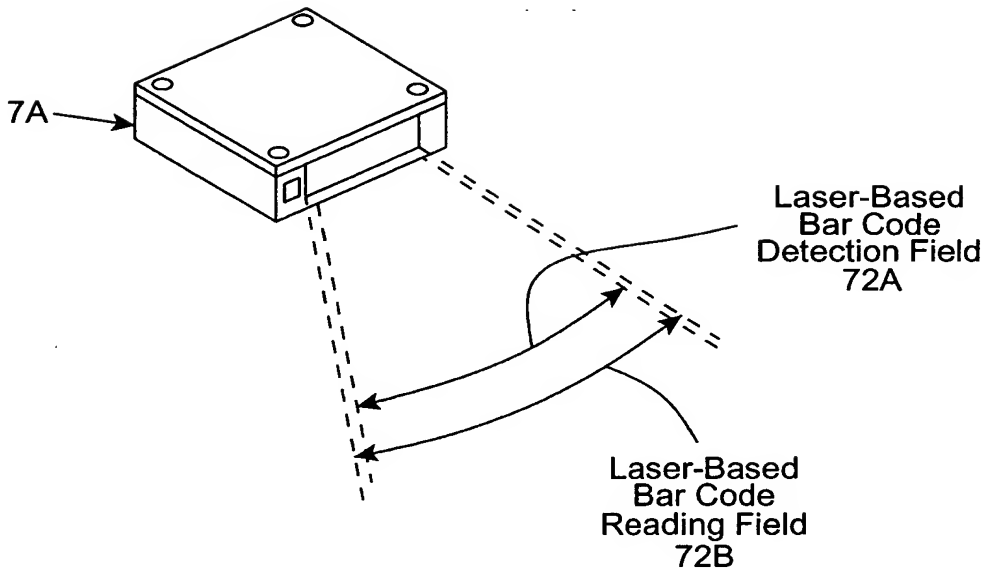
7A
Laser-Based
Bar Code
Detection Field
72A
Laser-Based
Bar Code
Reading Field
72B

FIG. 11B

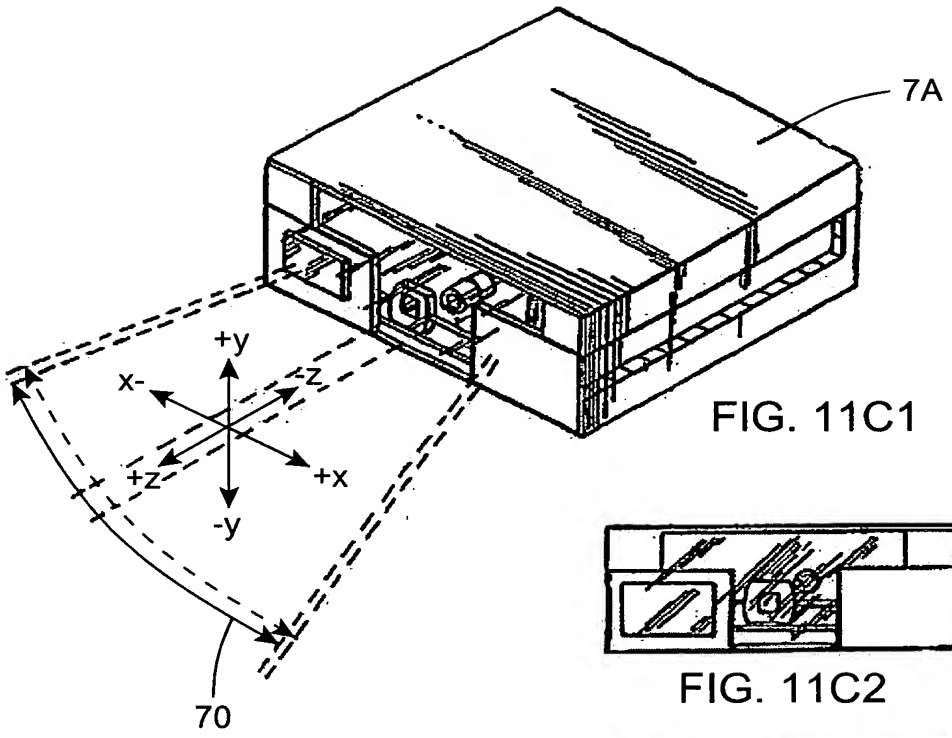

FIG. 11C1

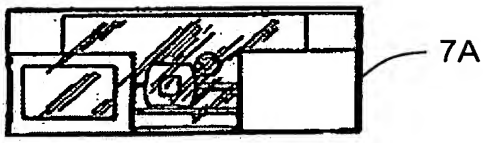

FIG. 11C2

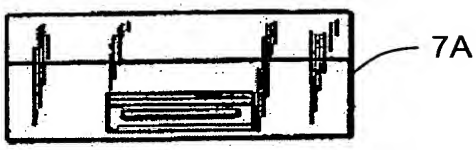

FIG. 11C3

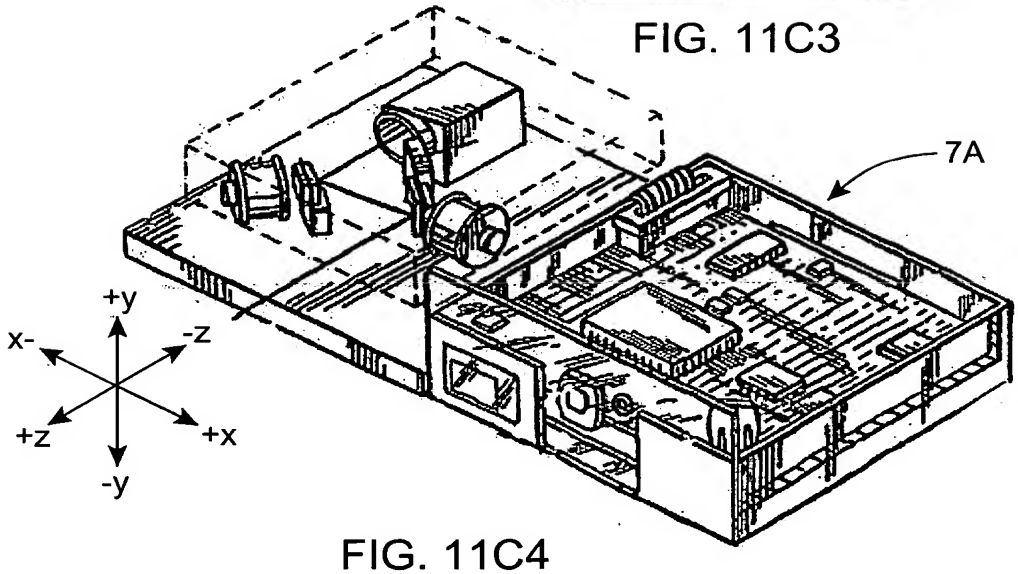

FIG. 11C4

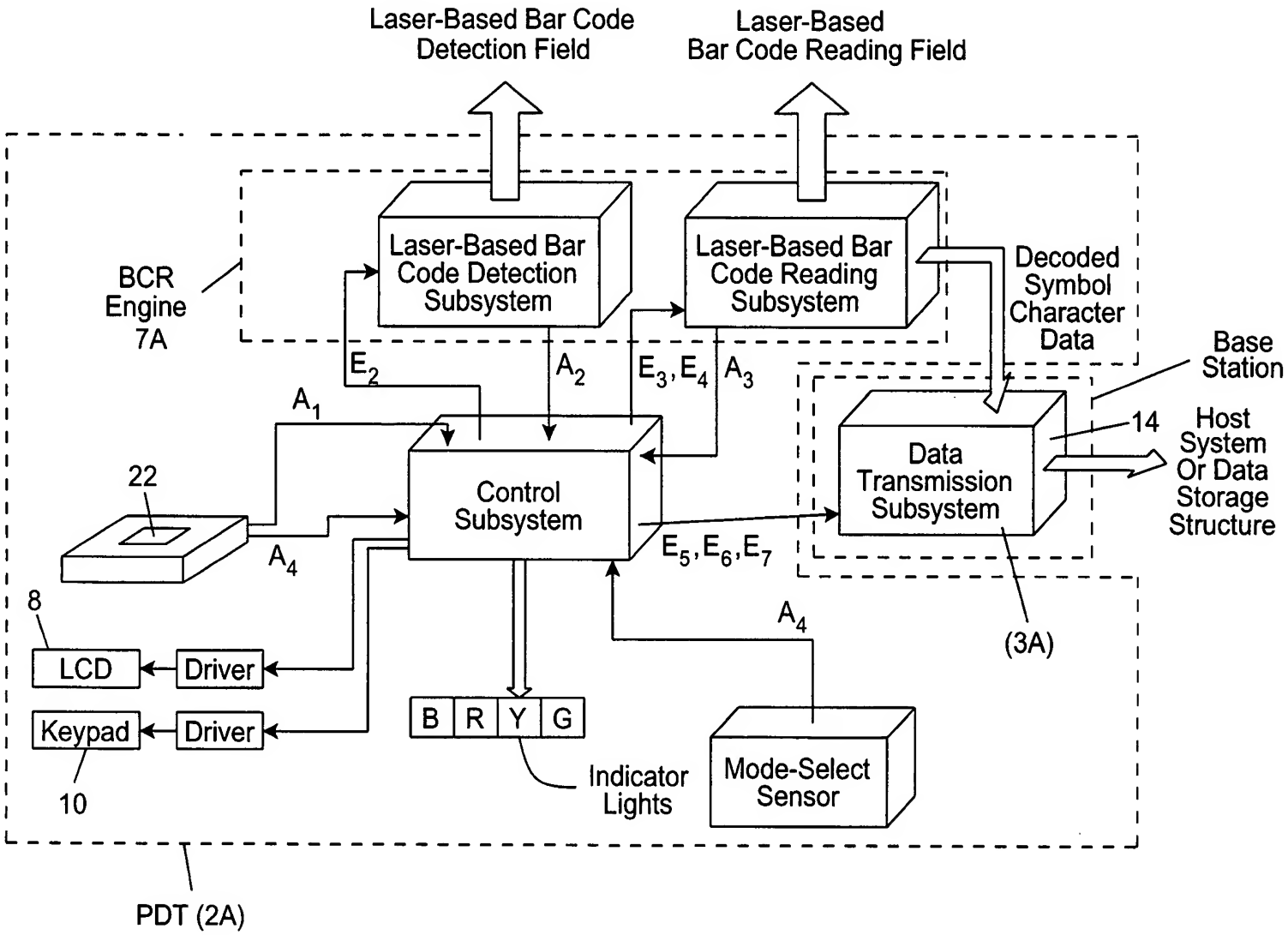
Laser-Based Bar Code Detection Field
Laser-Based Bar Code Reading Field
BCR Engine 7A
Laser-Based Bar Code Detection Subsystem
Laser-Based Bar Code Reading Subsystem
Decoded Symbol Character Data
Base Station
14
Host System Or Data Storage Structure
Data Transmission Subsystem
Control Subsystem
22
E_2
A_2
E_3, E_4
A_3
A_1
A_4
E_5, E_6, E_7
8
LCD
Driver
Keypad
Driver
10
B R Y G
Indicator Lights
Mode-Select Sensor
(3A)
PDT (2A)

FIG. 11D

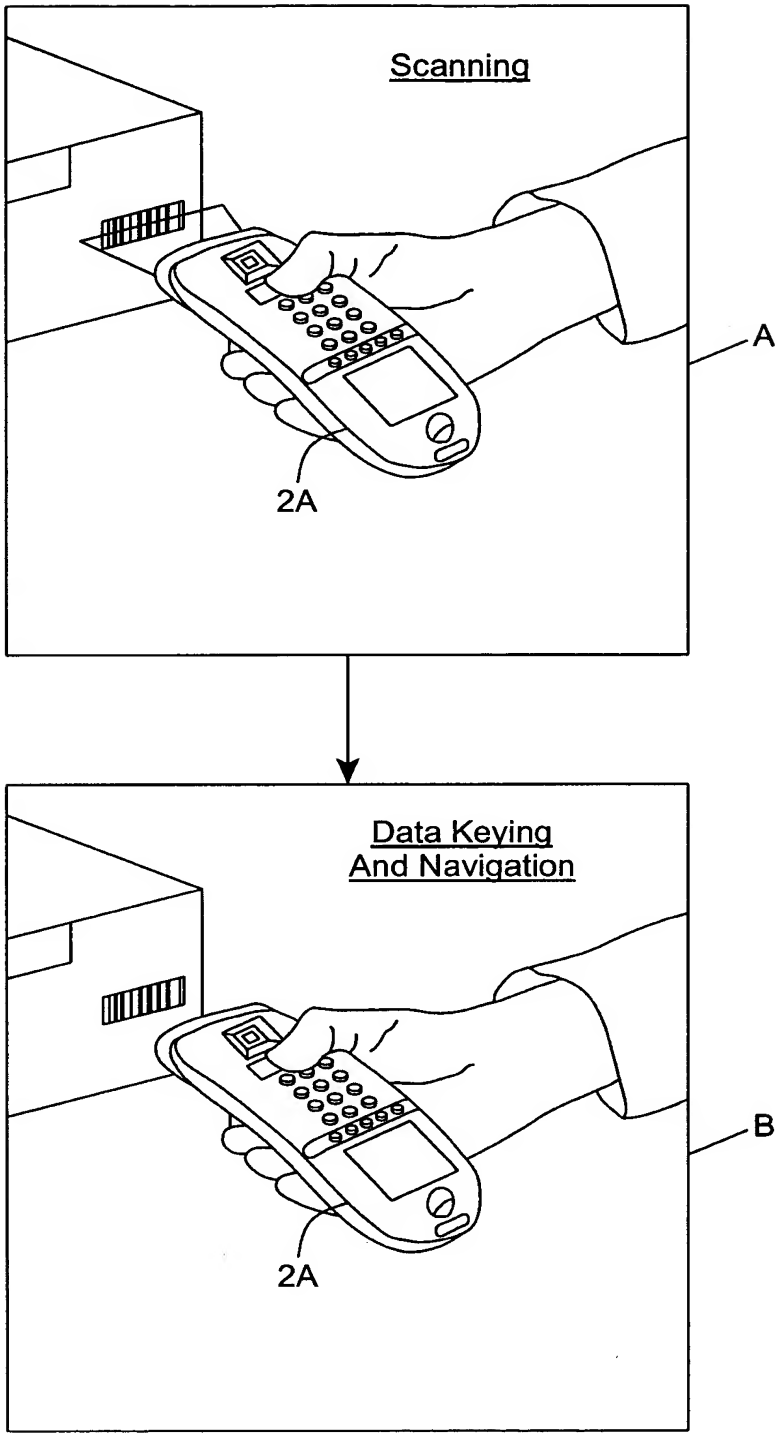

FIG. 11E

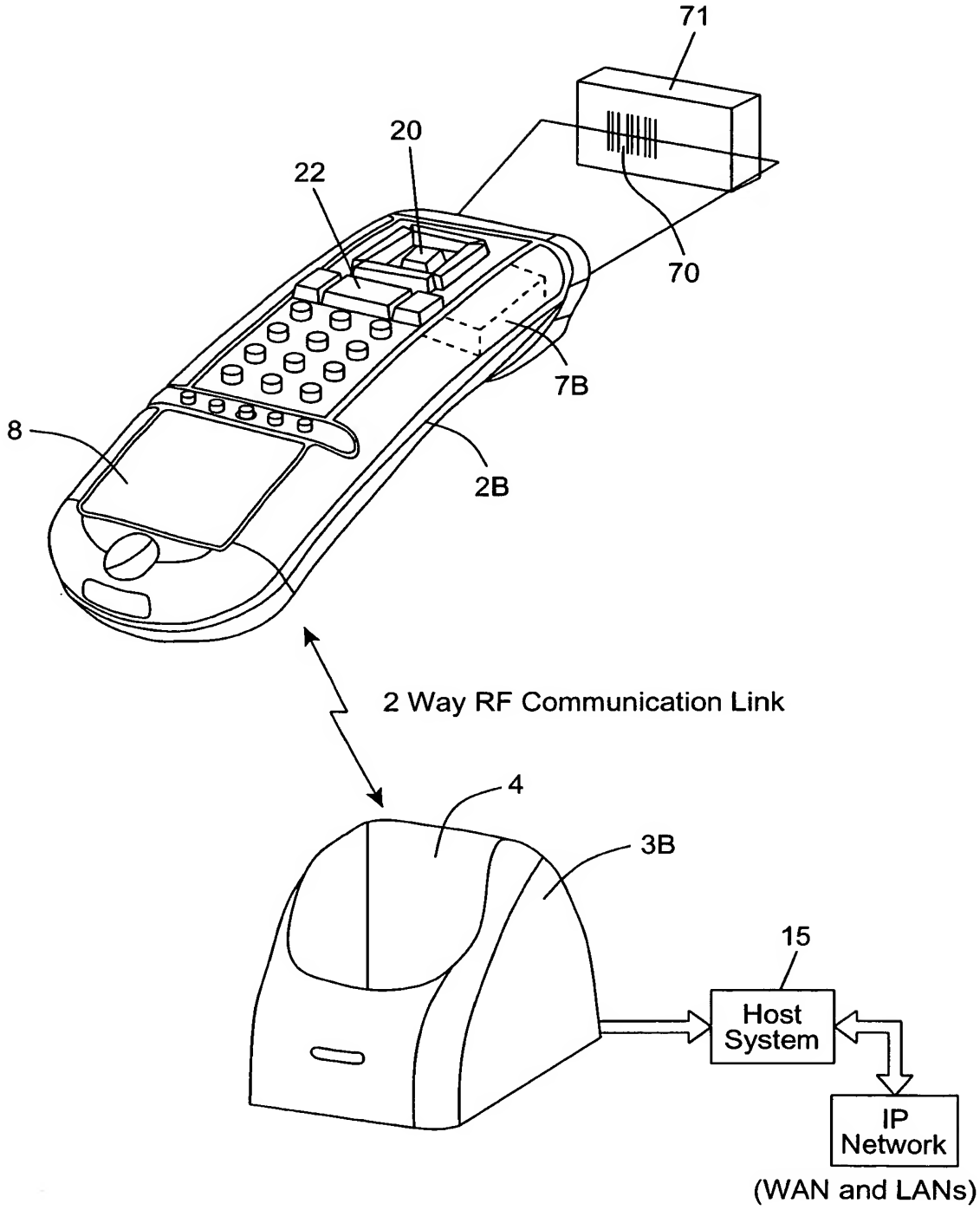
71
20
22
70
7B
8
2B
2 Way RF Communication Link
4
3B
15
Host System
IP Network
(WAN and LANs)

FIG. 12A

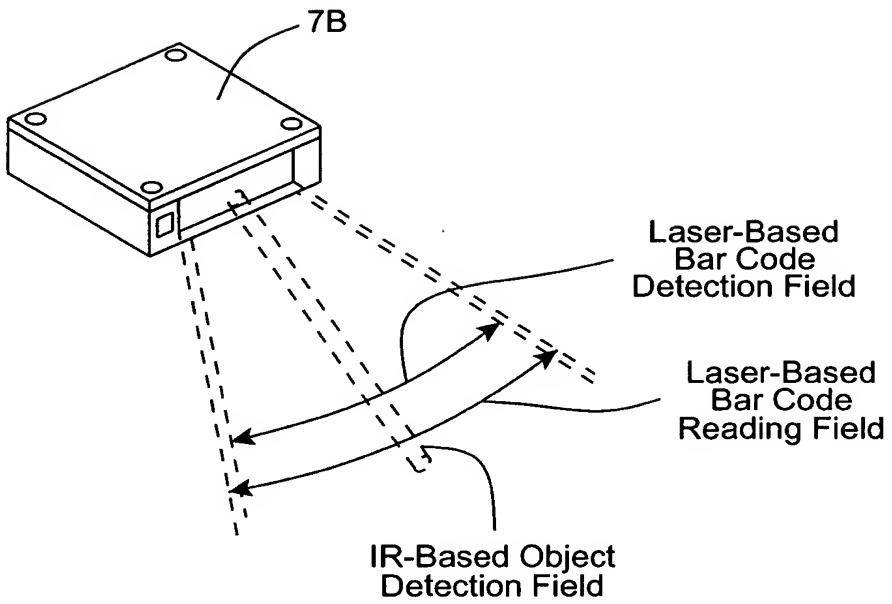
7B
Laser-Based
Bar Code
Detection Field
Laser-Based
Bar Code
Reading Field
IR-Based Object
Detection Field

FIG. 12B

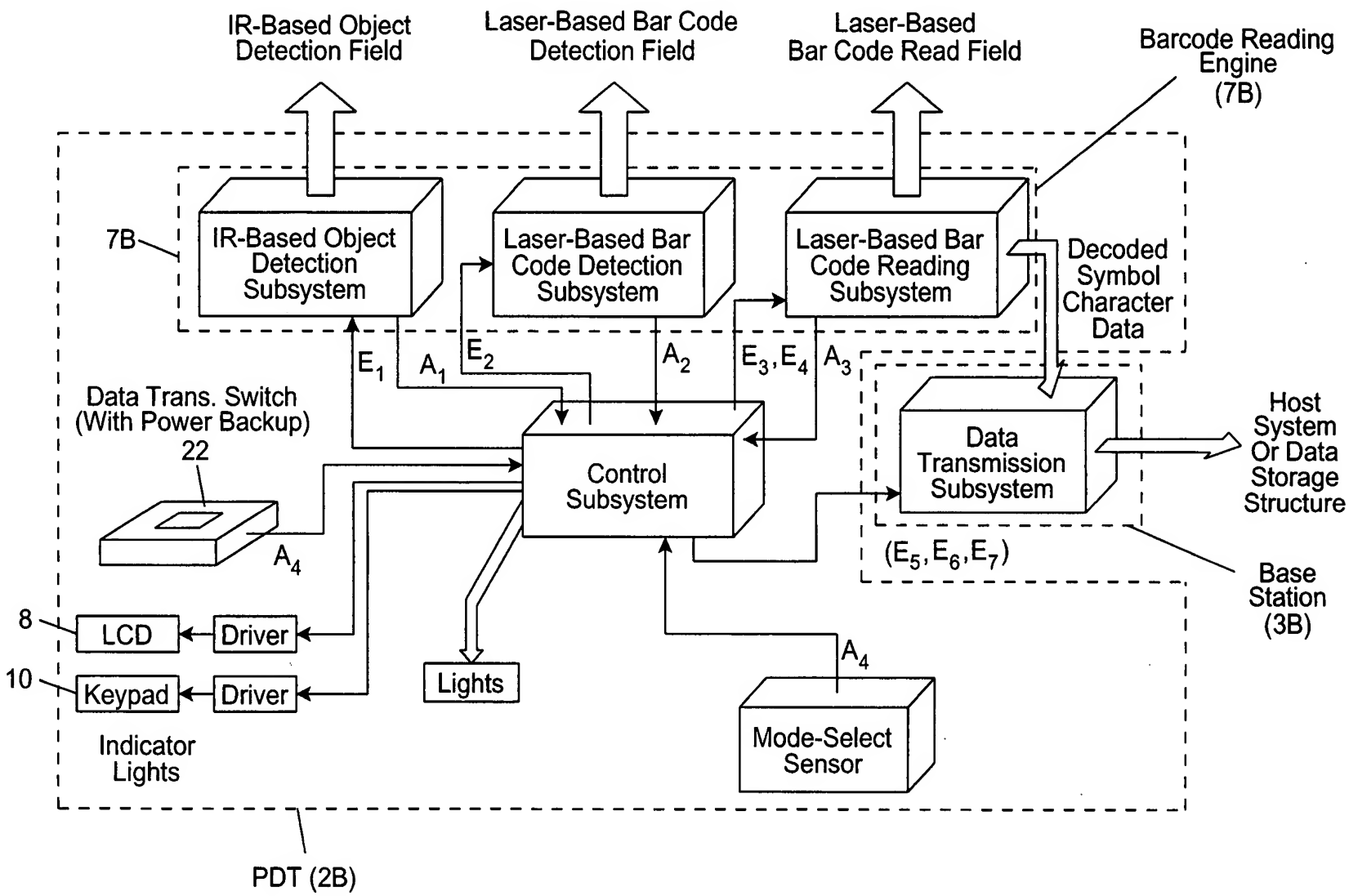
IR-Based Object Detection Field
Laser-Based Bar Code Detection Field
Laser-Based Bar Code Read Field
Barcode Reading Engine (7B)
7B
IR-Based Object Detection Subsystem
Laser-Based Bar Code Detection Subsystem
Laser-Based Bar Code Reading Subsystem
Decoded Symbol Character Data
E1
A1
E2
A2
E3, E4
A3
Data Trans. Switch (With Power Backup)
22
Control Subsystem
Data Transmission Subsystem
Host System Or Data Storage Structure
A4
(E5, E6, E7)
Base Station (3B)
8
LCD
Driver
10
Keypad
Driver
Lights
A4
Mode-Select Sensor
Indicator Lights
PDT (2B)

FIG. 12C

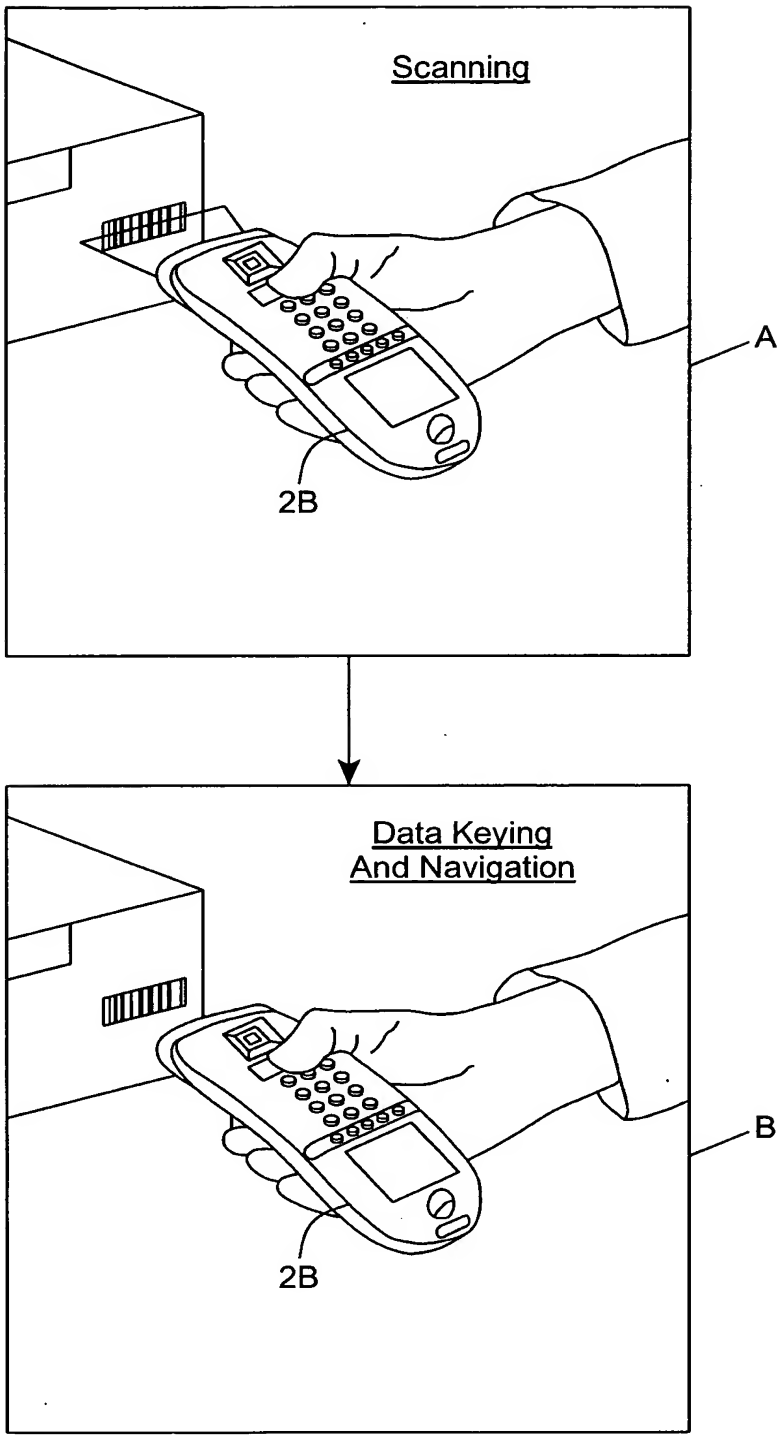

FIG. 12D

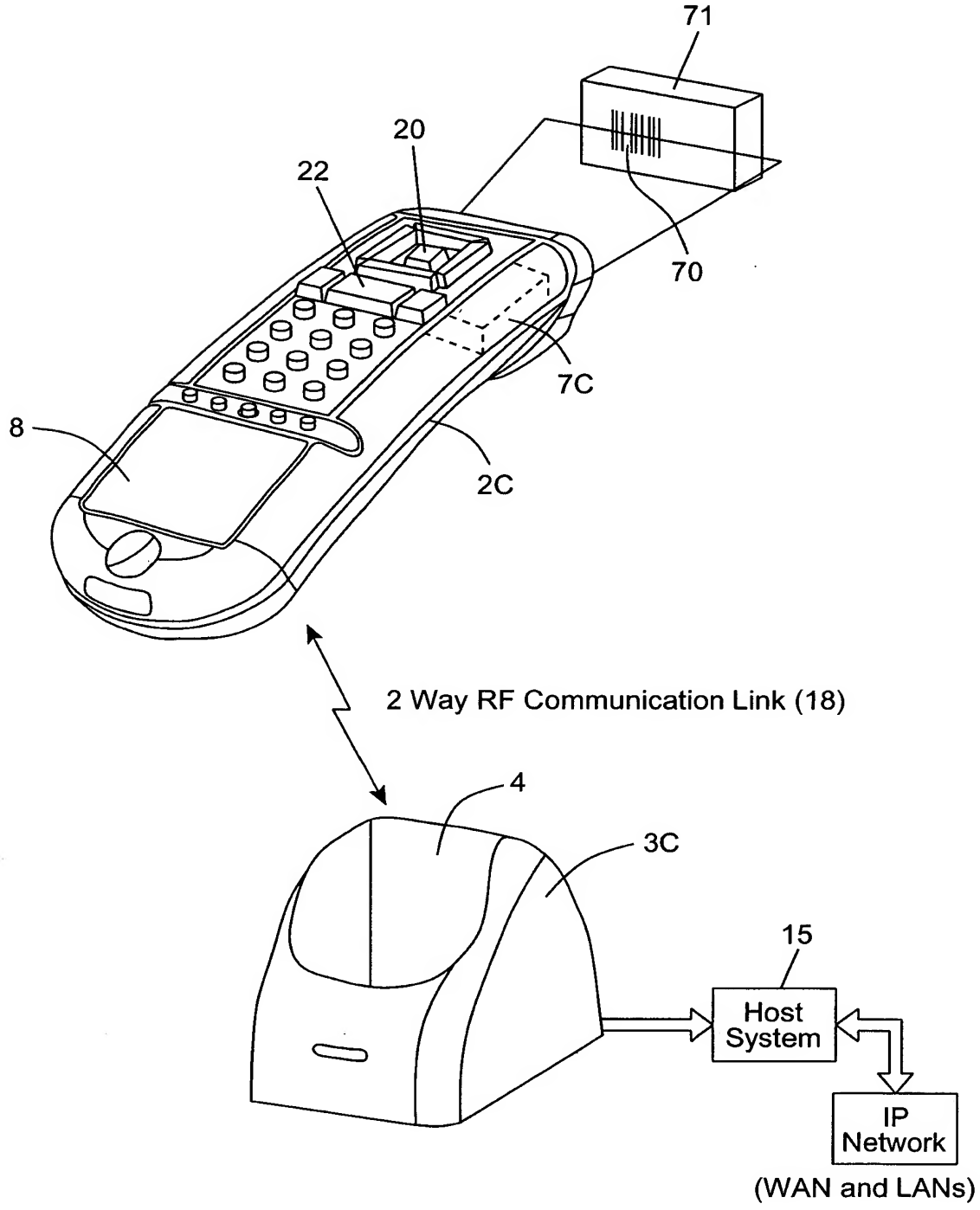
71
20
22
70
7C
8
2C
2 Way RF Communication Link (18)
4
3C
15
Host System
IP Network
(WAN and LANs)

FIG. 13A

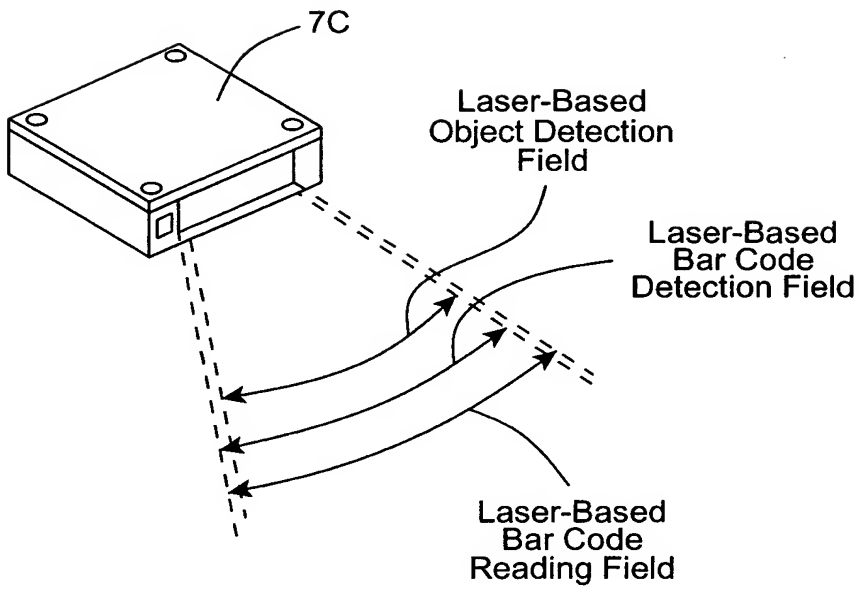
7C
Laser-Based
Object Detection
Field
Laser-Based
Bar Code
Detection Field
Laser-Based
Bar Code
Reading Field

FIG. 13B

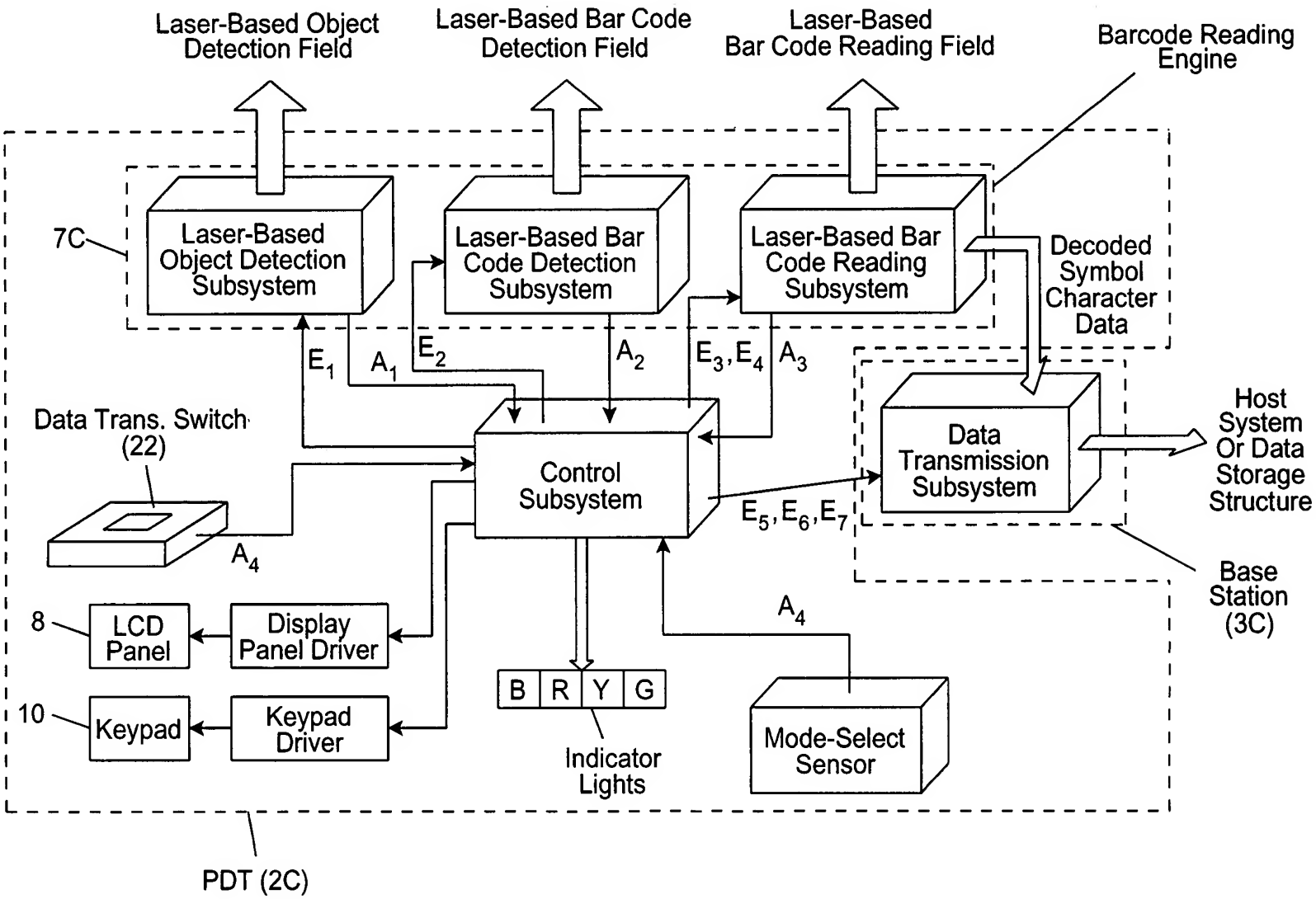
Laser-Based Object Detection Field
Laser-Based Bar Code Detection Field
Laser-Based Bar Code Reading Field
Barcode Reading Engine
7C
Laser-Based Object Detection Subsystem
Laser-Based Bar Code Detection Subsystem
Laser-Based Bar Code Reading Subsystem
Decoded Symbol Character Data
E1
A1
E2
A2
E3, E4
A3
Data Trans. Switch (22)
Control Subsystem
Data Transmission Subsystem
Host System Or Data Storage Structure
A4
E5, E6, E7
Base Station (3C)
8
LCD Panel
Display Panel Driver
A4
B
R
Y
G
10
Keypad
Keypad Driver
Indicator Lights
Mode-Select Sensor
PDT (2C)

FIG. 13C

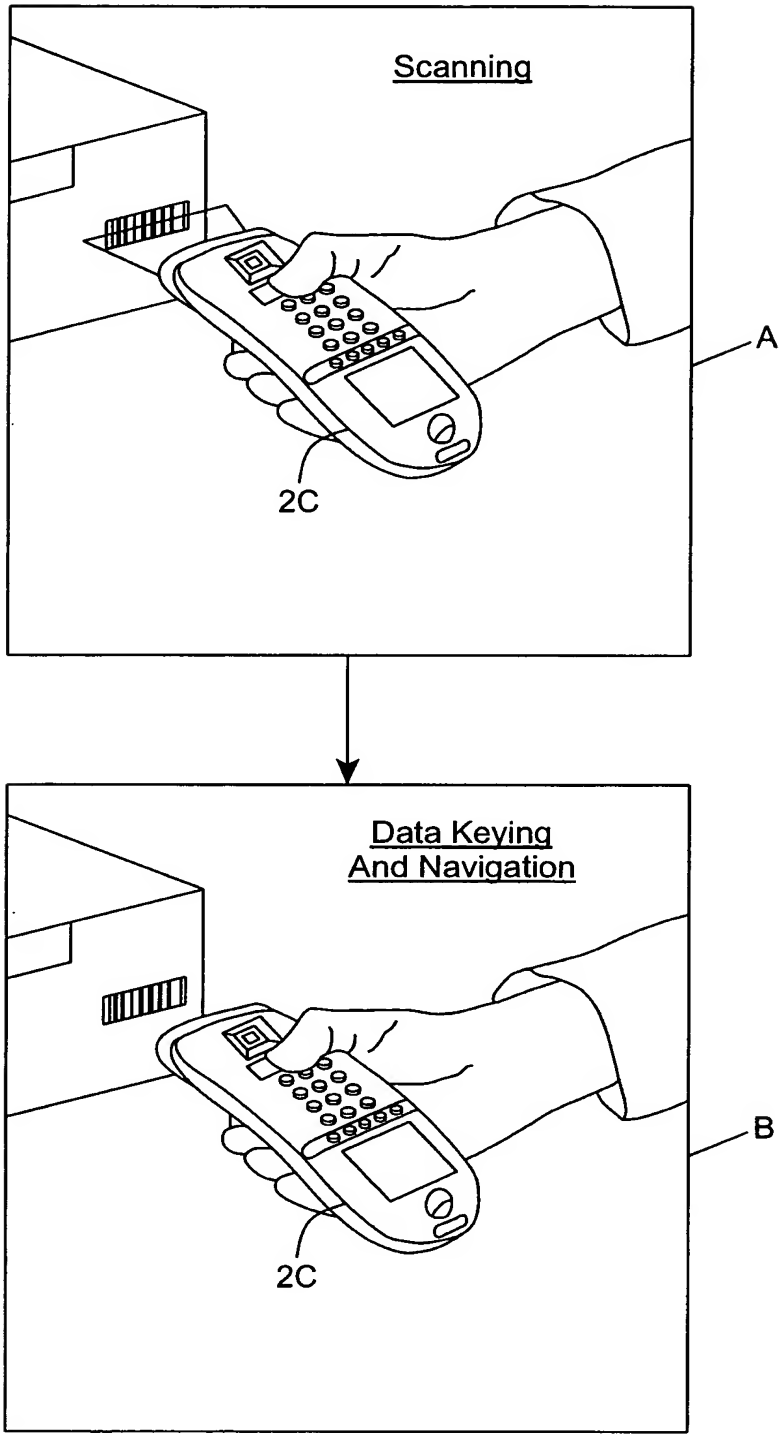

FIG. 13D

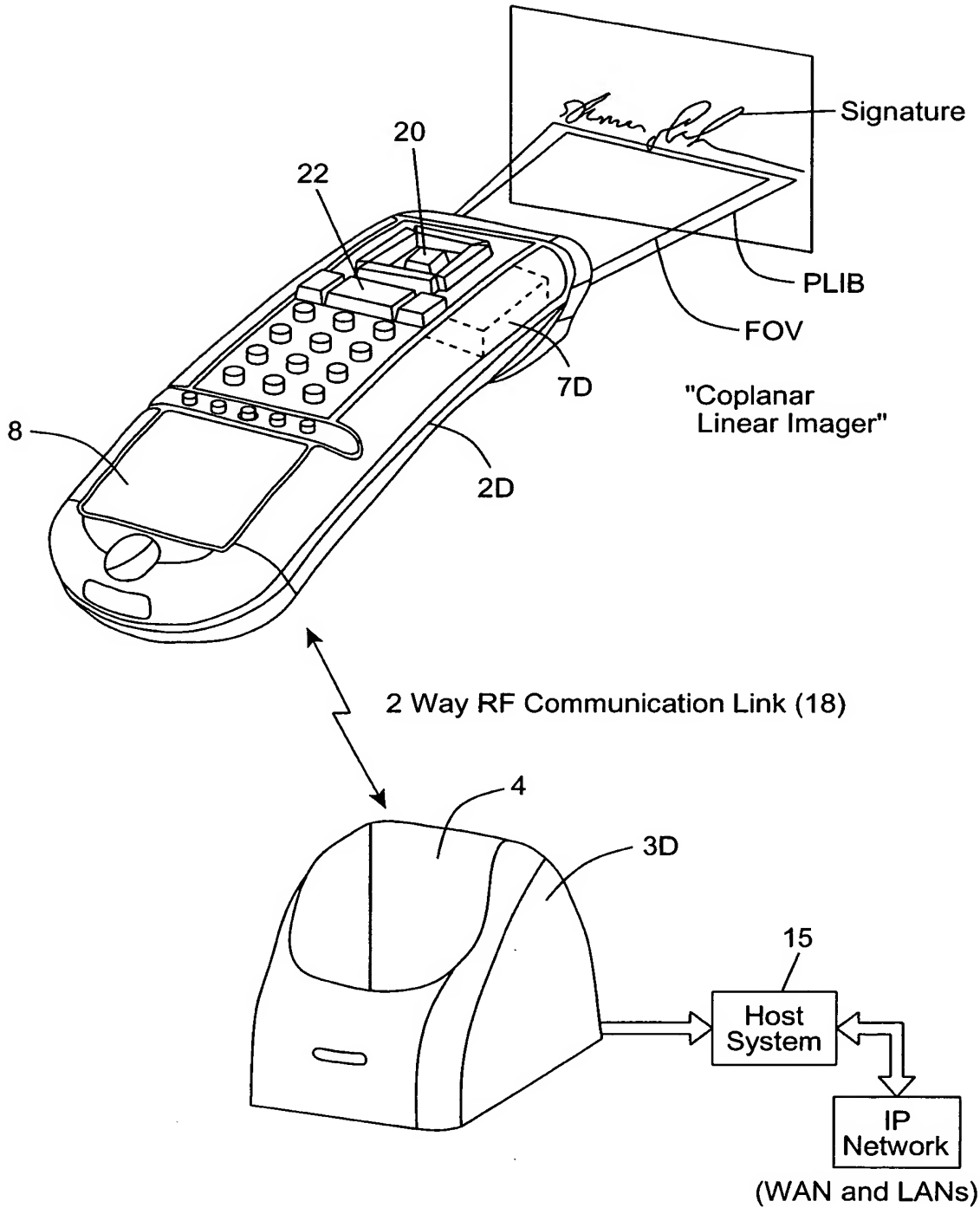
Signature
20
22
PLIB
FOV
7D
"Coplanar
Linear Imager"
8
2D
2 Way RF Communication Link (18)
4
3D
15
Host
System
IP
Network
(WAN and LANs)

FIG. 14A

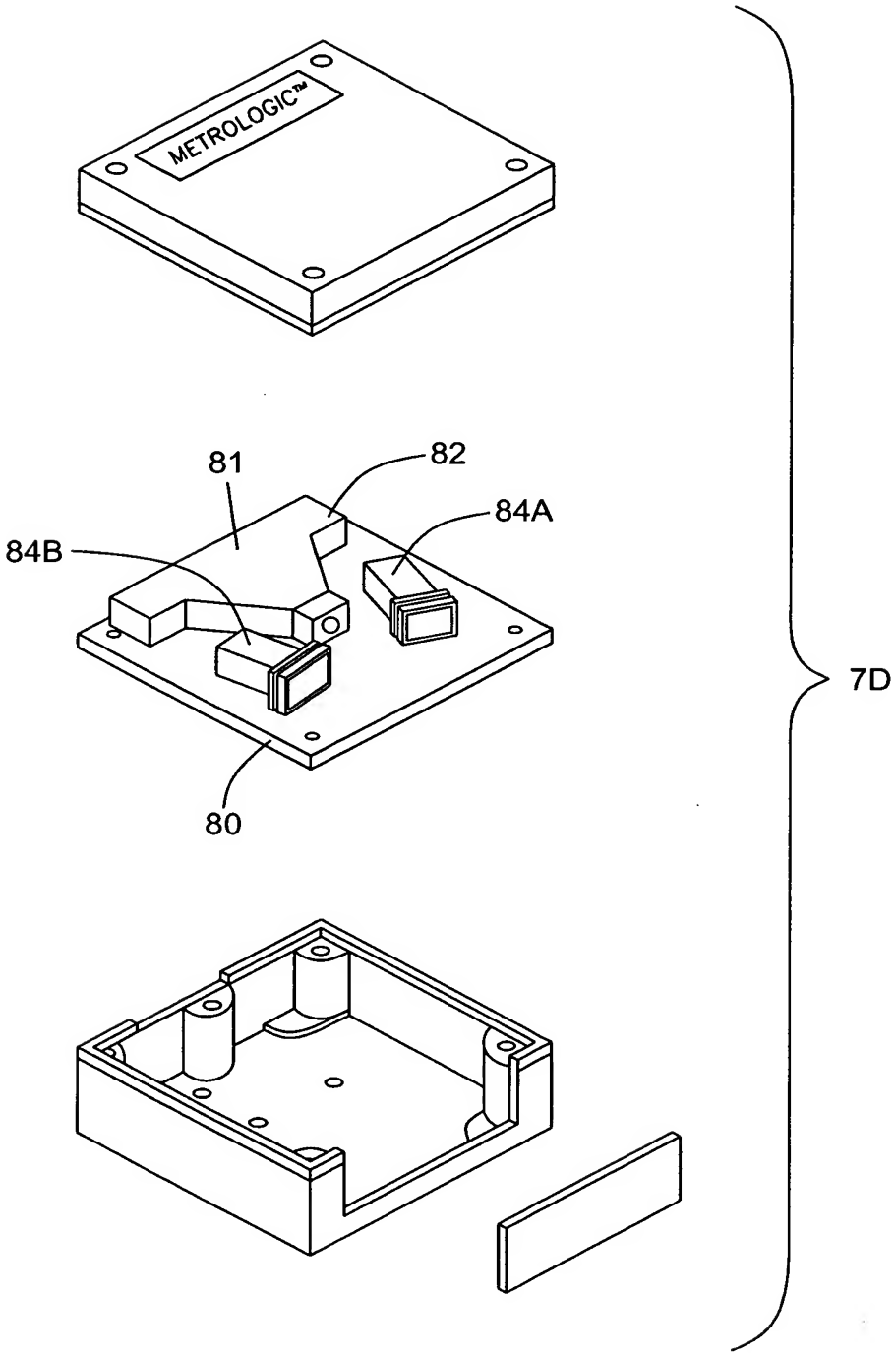

FIG. 14B

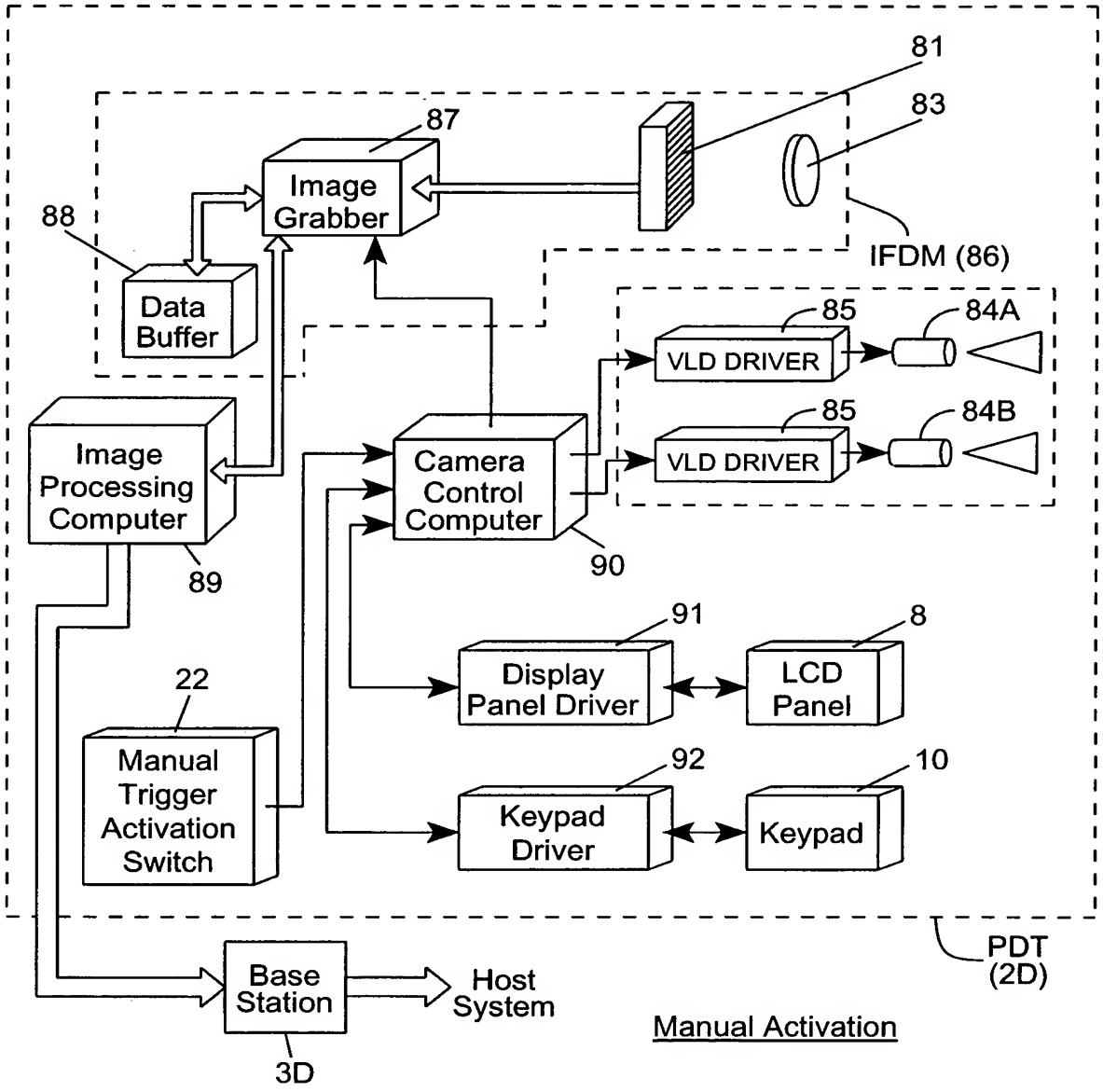
81
83
87
Image Grabber
88
Data Buffer
IFDM (86)
85
84A
VLD DRIVER
85
84B
VLD DRIVER
Image Processing Computer
Camera Control Computer
89
90
91
8
Display Panel Driver
LCD Panel
22
Manual Trigger Activation Switch
92
10
Keypad Driver
Keypad
PDT (2D)
Base Station
Host System
3D
Manual Activation

FIG. 14C

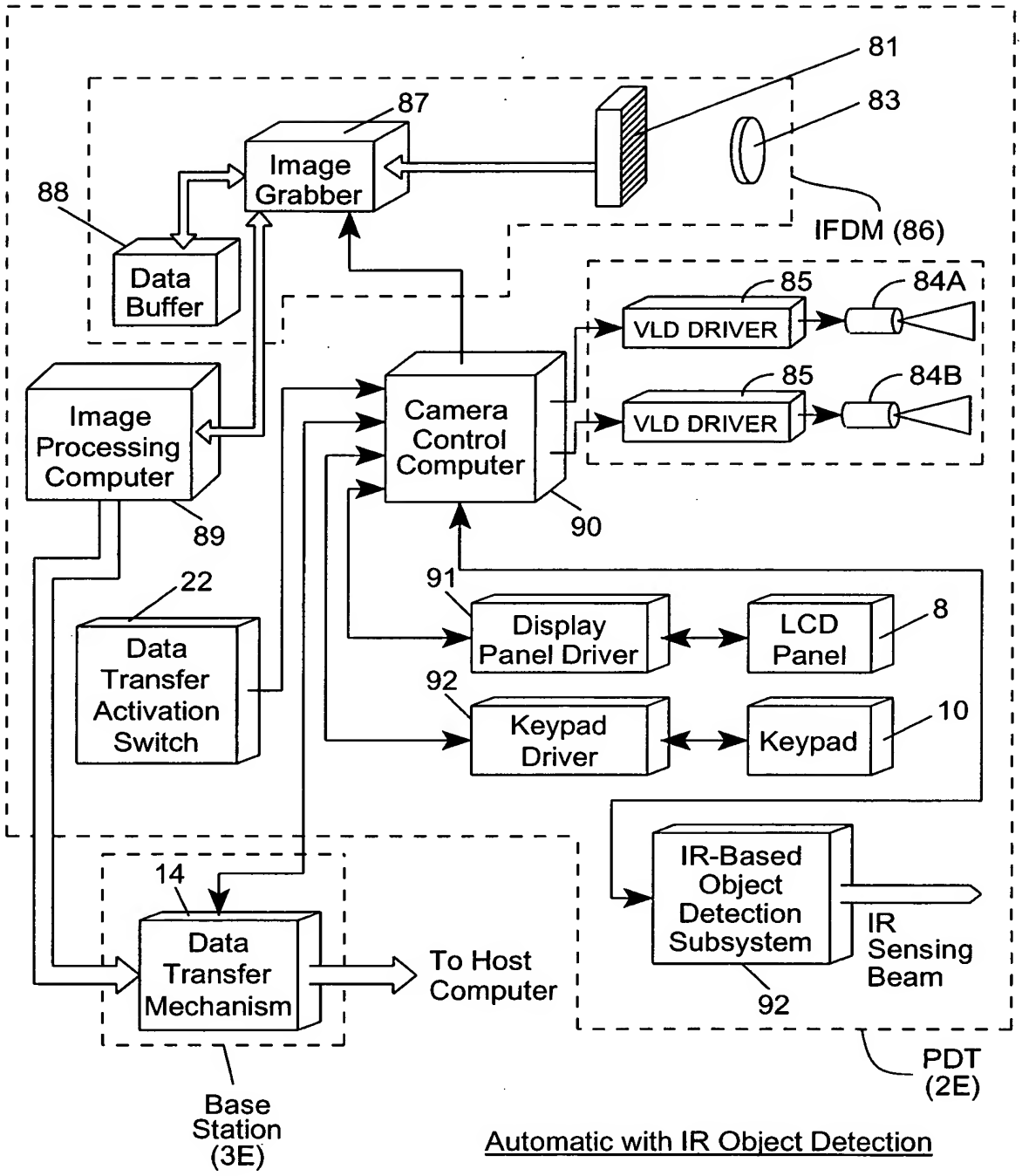
81
83
87
Image Grabber
88
Data Buffer
IFDM (86)
85
84A
VLD DRIVER
85
84B
VLD DRIVER
Image Processing Computer
Camera Control Computer
89
90
91
22
Data Transfer Activation Switch
Display Panel Driver
LCD Panel
8
92
Keypad Driver
Keypad
10
IR-Based Object Detection Subsystem
IR Sensing Beam
14
Data Transfer Mechanism
To Host Computer
92
PDT (2E)
Base Station (3E)
Automatic with IR Object Detection

FIG. 14D

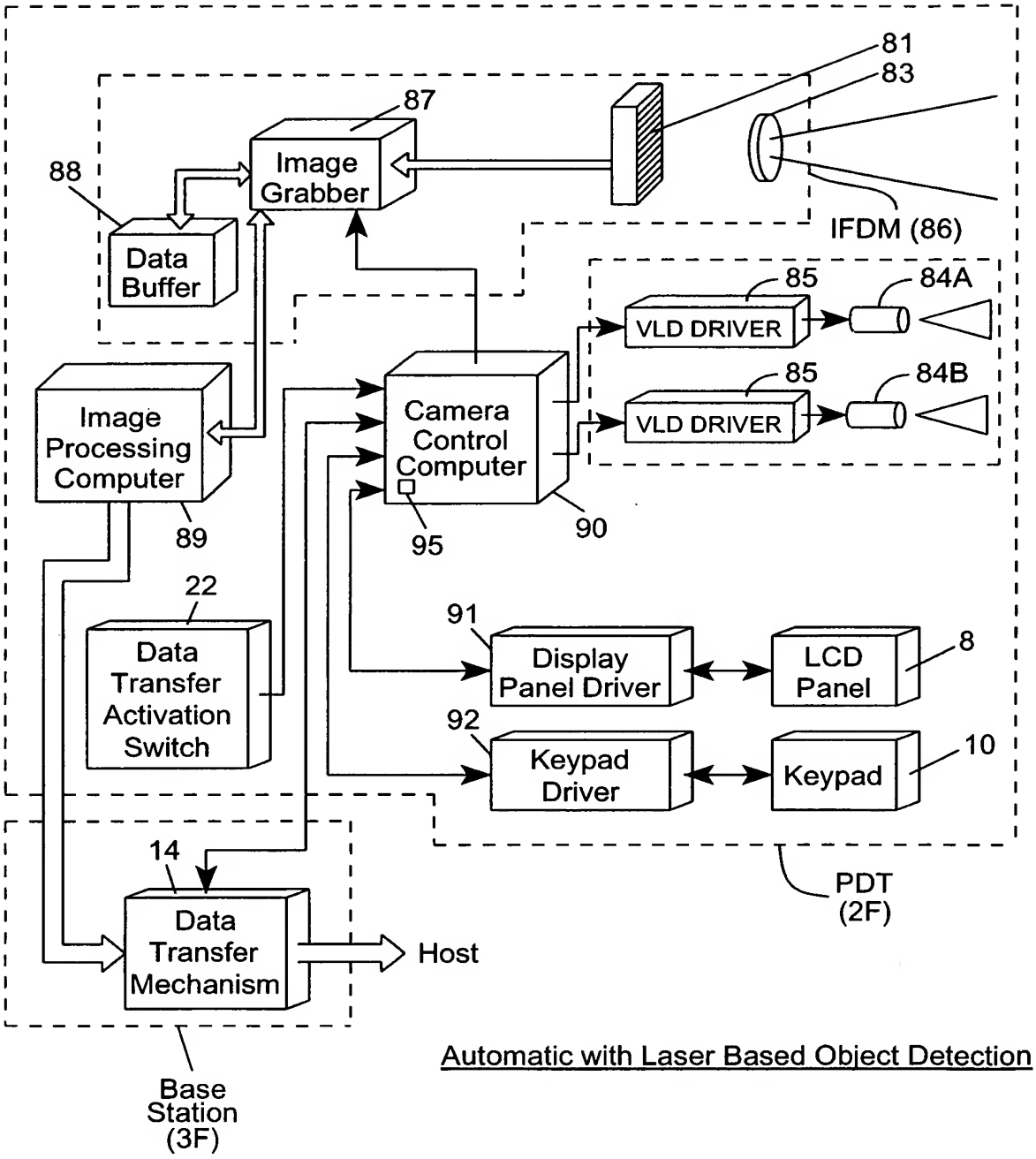
81
83
87
Image Grabber
88
Data Buffer
IFDM (86)
85
84A
VLD DRIVER
85
84B
VLD DRIVER
Image Processing Computer
Camera Control Computer
89
95
90
22
Data Transfer Activation Switch
91
Display Panel Driver
LCD Panel
8
92
Keypad Driver
Keypad
10
14
Data Transfer Mechanism
Host
PDT (2F)
Base Station (3F)
Automatic with Laser Based Object Detection

FIG. 14E

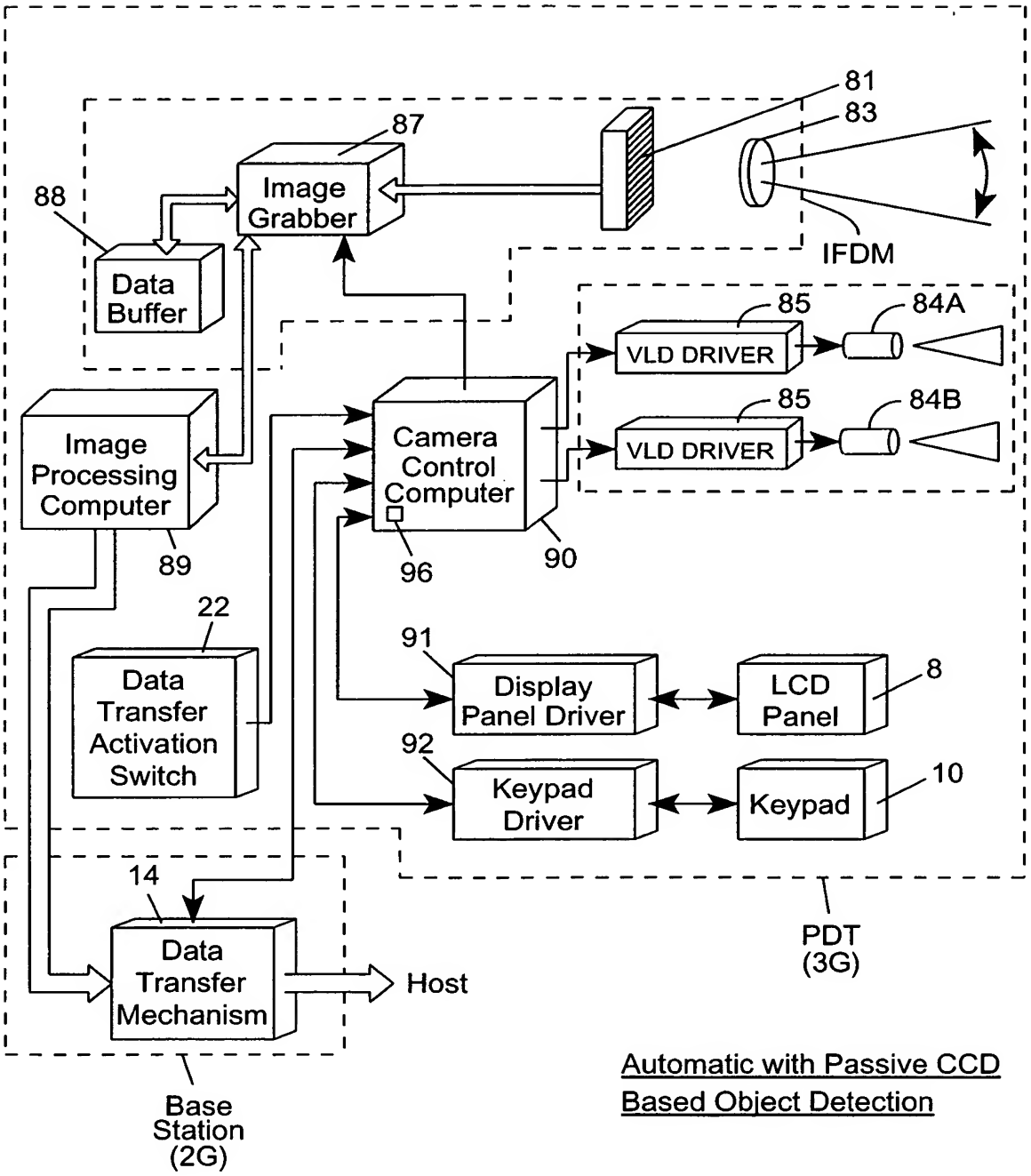
81
83
87
Image Grabber
88
Data Buffer
IFDM
85
84A
VLD DRIVER
85
84B
VLD DRIVER
Image Processing Computer
Camera Control Computer
89
96
90
22
Data Transfer Activation Switch
91
Display Panel Driver
LCD Panel
8
92
Keypad Driver
Keypad
10
14
Data Transfer Mechanism
Host
PDT (3G)
Base Station (2G)
Automatic with Passive CCD Based Object Detection

FIG. 14F

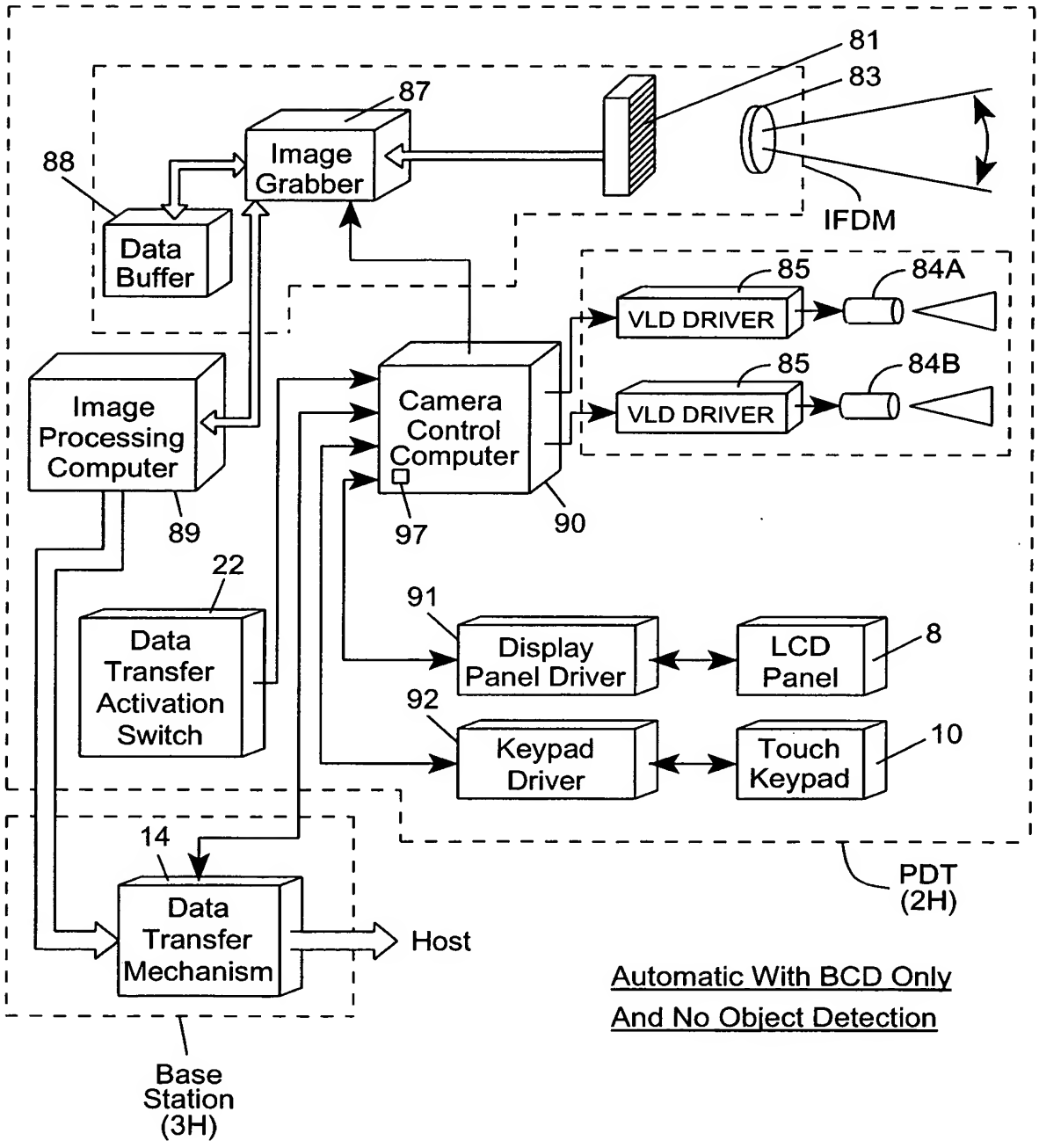
81
83
87
88
Image Grabber
Data Buffer
IFDM
85
84A
VLD DRIVER
85
84B
VLD DRIVER
Image Processing Computer
Camera Control Computer
89
97
90
22
91
Data Transfer Activation Switch
Display Panel Driver
LCD Panel
8
92
Keypad Driver
Touch Keypad
10
14
Data Transfer Mechanism
Host
PDT (2H)
Automatic With BCD Only
And No Object Detection
Base Station (3H)

FIG. 14G

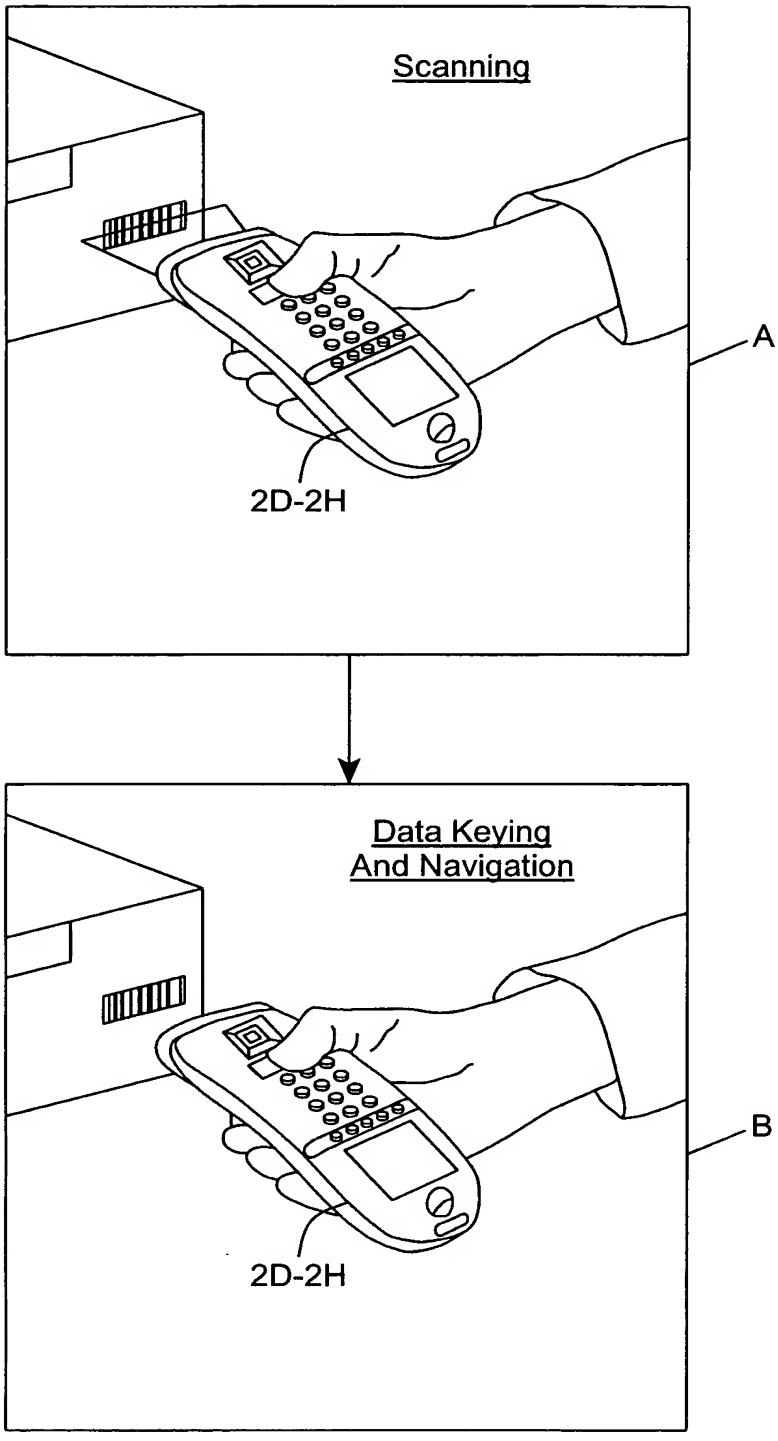

FIG. 14H

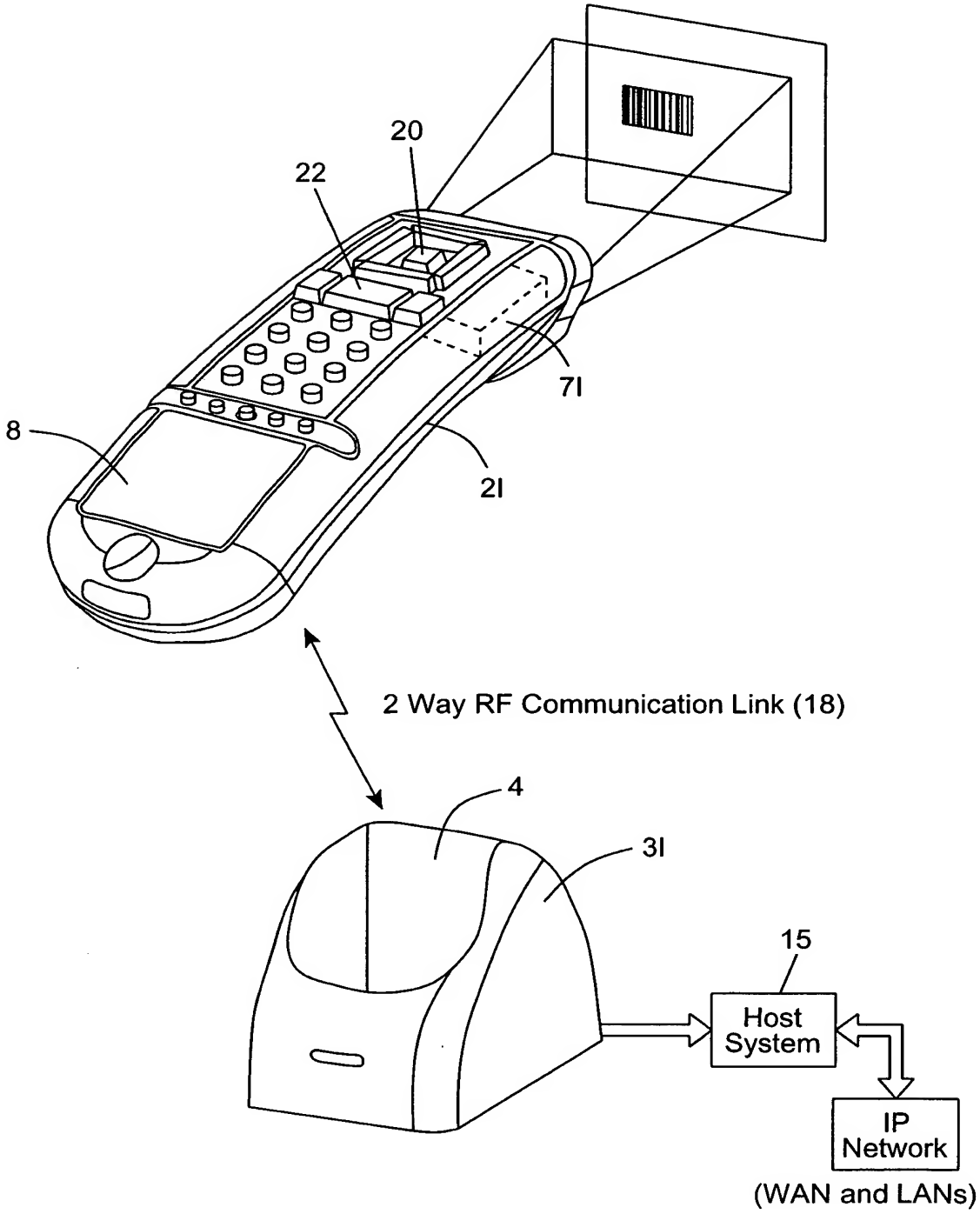
20
22
7I
8
2I
2 Way RF Communication Link (18)
4
3I
15
Host System
IP Network
(WAN and LANs)

FIG. 15A

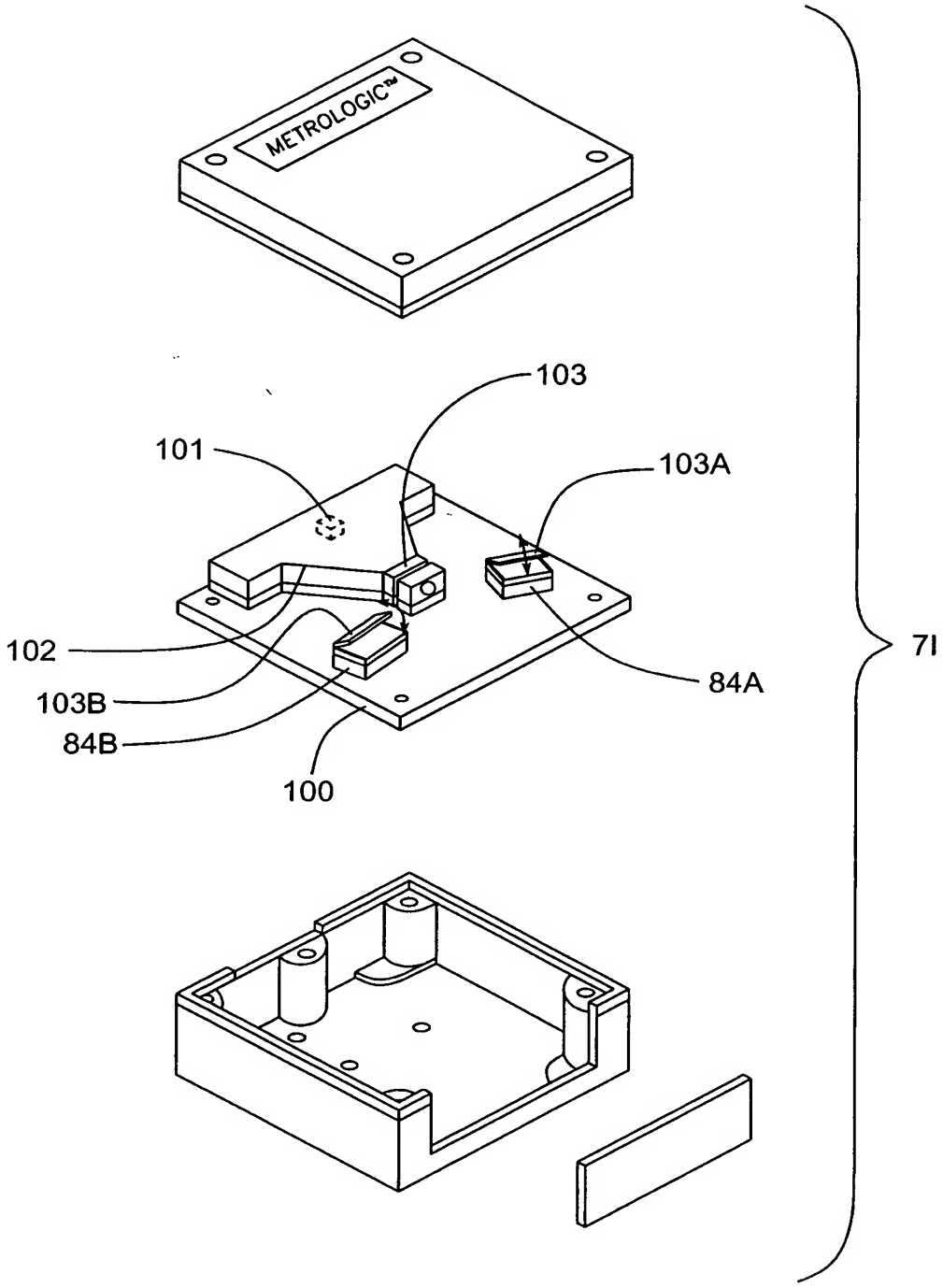

FIG. 15B

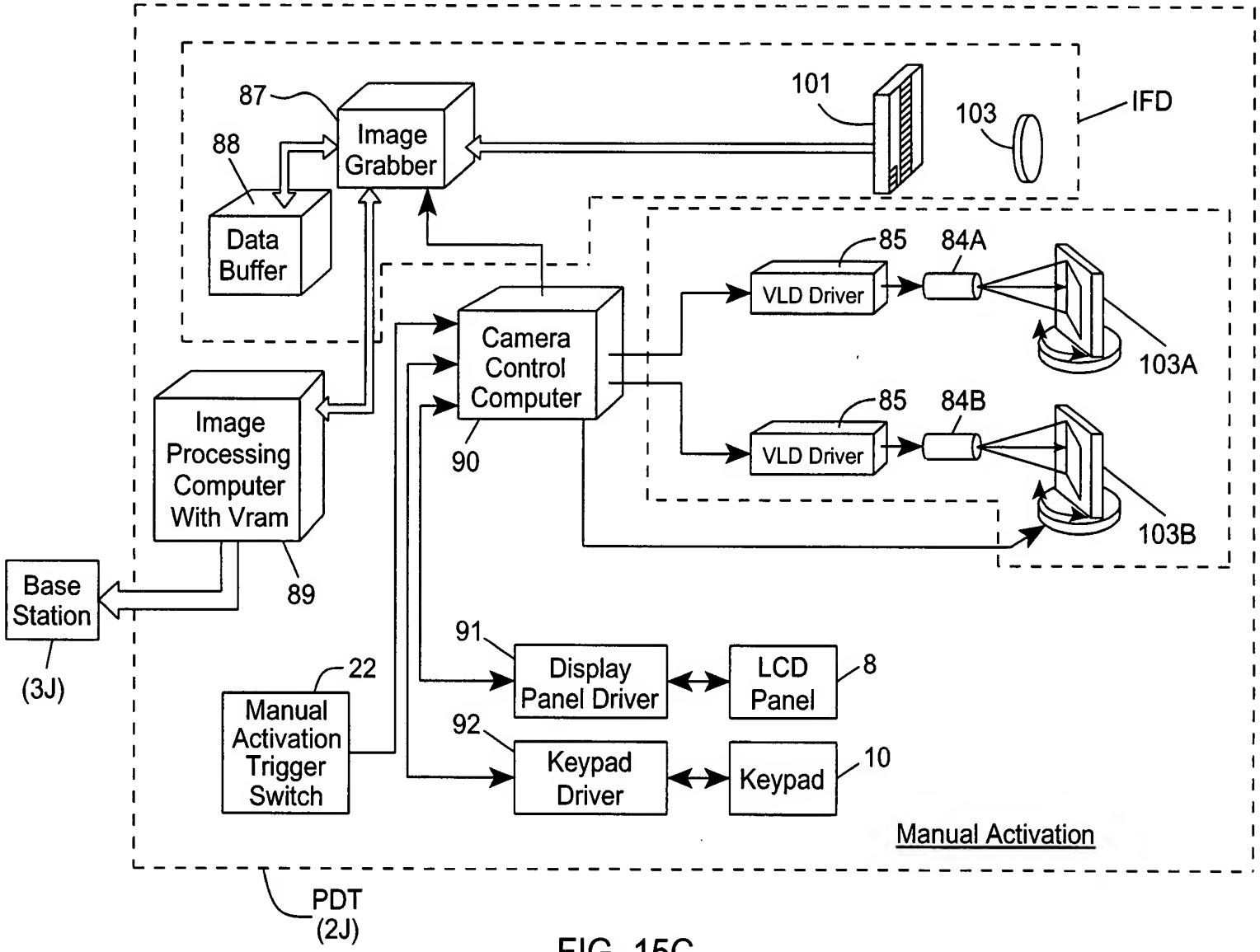
87
Image Grabber
88
Data Buffer
101
103
IFD
85
84A
VLD Driver
103A
85
84B
VLD Driver
103B
Camera Control Computer
90
Image Processing Computer With Vram
89
Base Station
(3J)
22
Manual Activation Trigger Switch
91
Display Panel Driver
LCD Panel
8
92
Keypad Driver
Keypad
10
Manual Activation
PDT
(2J)

FIG. 15C

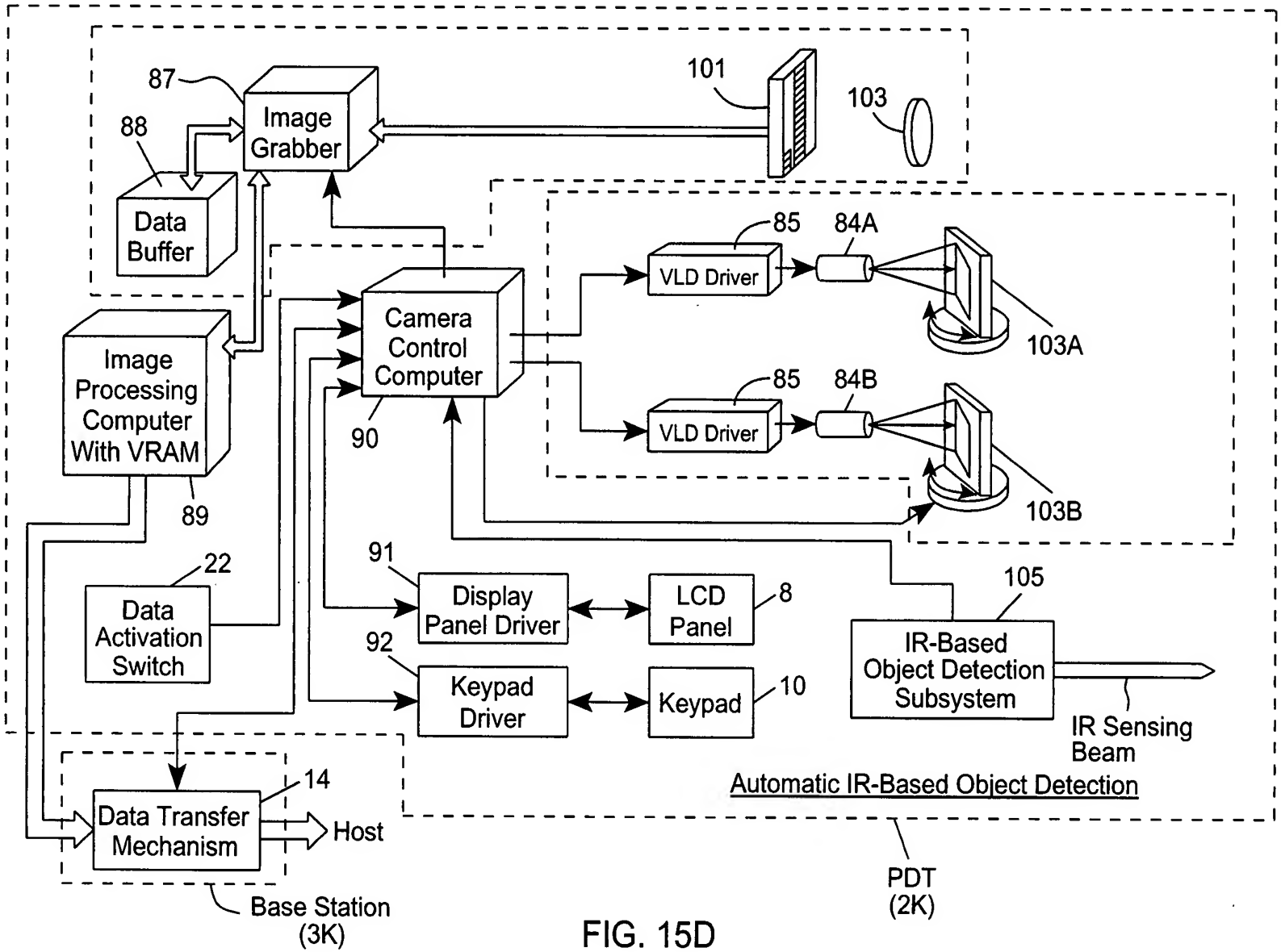
87
88
Image Grabber
101
103
Data Buffer
85
84A
VLD Driver
103A
Camera Control Computer
Image Processing Computer With VRAM
90
85
84B
VLD Driver
103B
89
91
22
Data Activation Switch
Display Panel Driver
LCD Panel
8
105
92
Keypad Driver
Keypad
10
IR-Based Object Detection Subsystem
IR Sensing Beam
14
Data Transfer Mechanism
Host
Automatic IR-Based Object Detection
Base Station (3K)
PDT (2K)

FIG. 15D

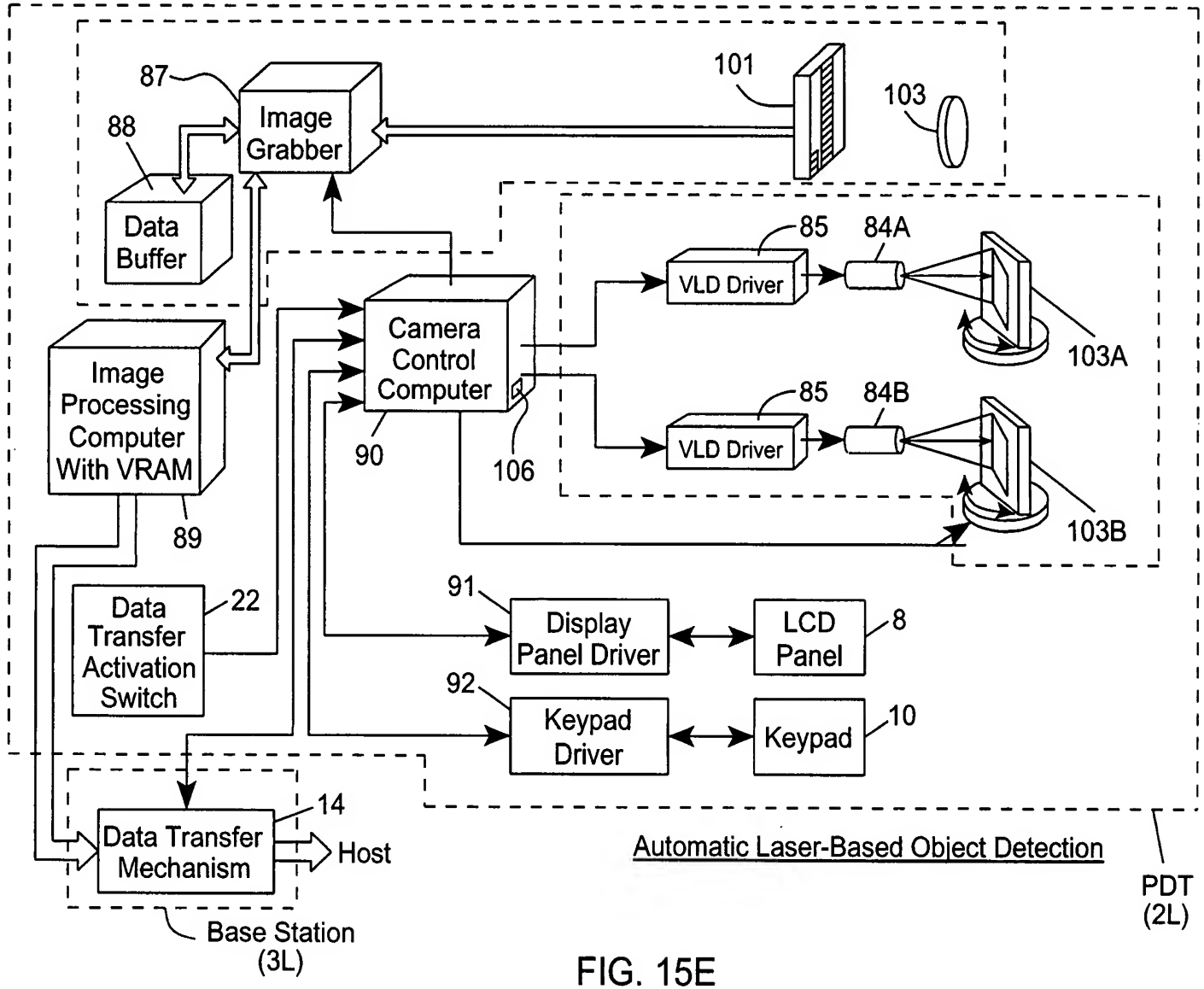
87
88
Image Grabber
101
103
Data Buffer
85
84A
VLD Driver
103A
Camera Control Computer
Image Processing Computer With VRAM
90
106
85
84B
VLD Driver
103B
89
Data Transfer Activation Switch
22
91
Display Panel Driver
LCD Panel
8
92
Keypad Driver
Keypad
10
14
Data Transfer Mechanism
Host
Automatic Laser-Based Object Detection
PDT (2L)
Base Station (3L)

FIG. 15E

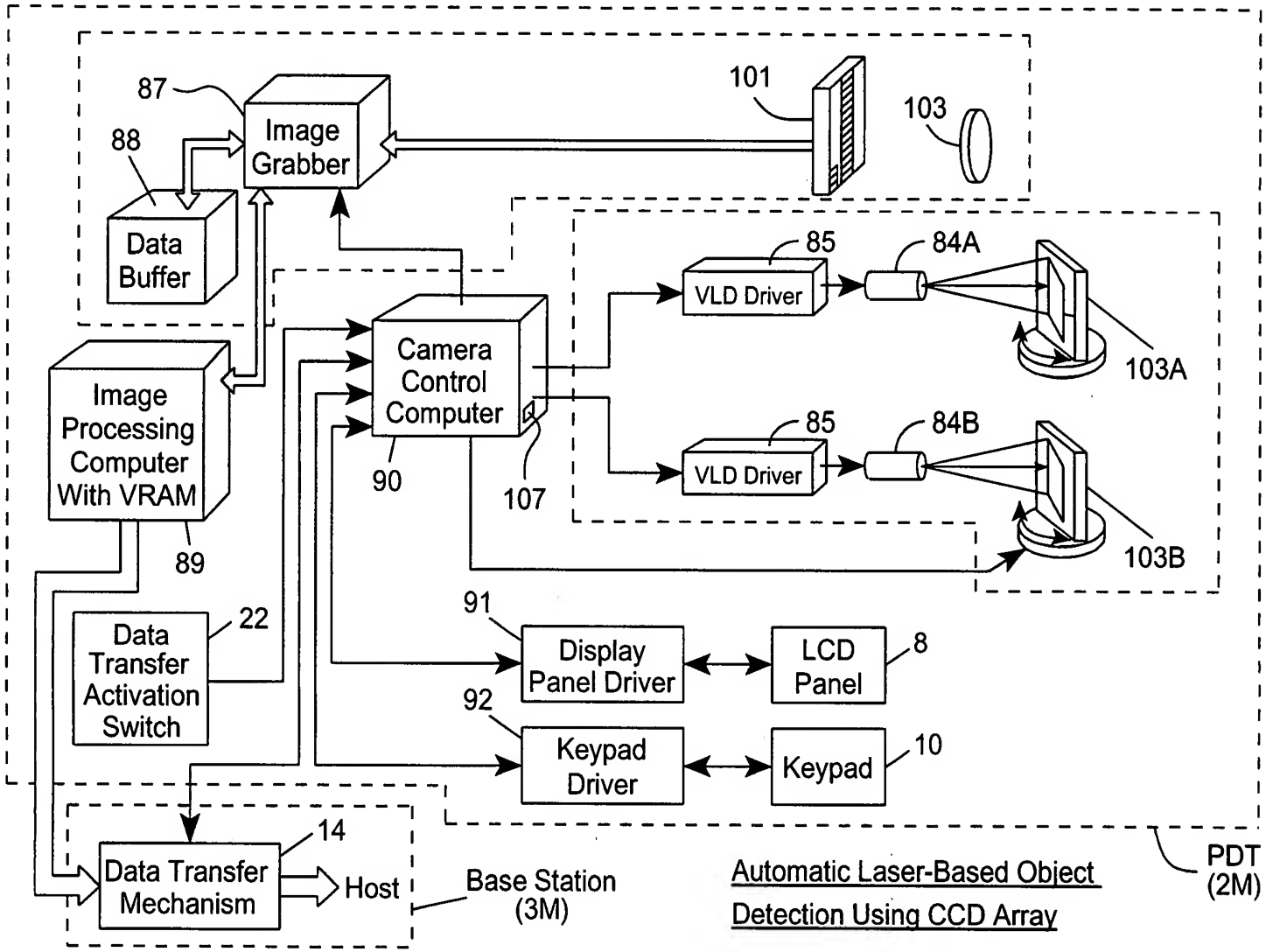
87
88
Image Grabber
101
103
Data Buffer
85
84A
VLD Driver
103A
Camera Control Computer
Image Processing Computer With VRAM
90
107
85
84B
VLD Driver
103B
89
91
22
Data Transfer Activation Switch
Display Panel Driver
LCD Panel
8
92
Keypad Driver
Keypad
10
14
Data Transfer Mechanism
Host
Base Station (3M)
Automatic Laser-Based Object Detection Using CCD Array
PDT (2M)

FIG. 15F

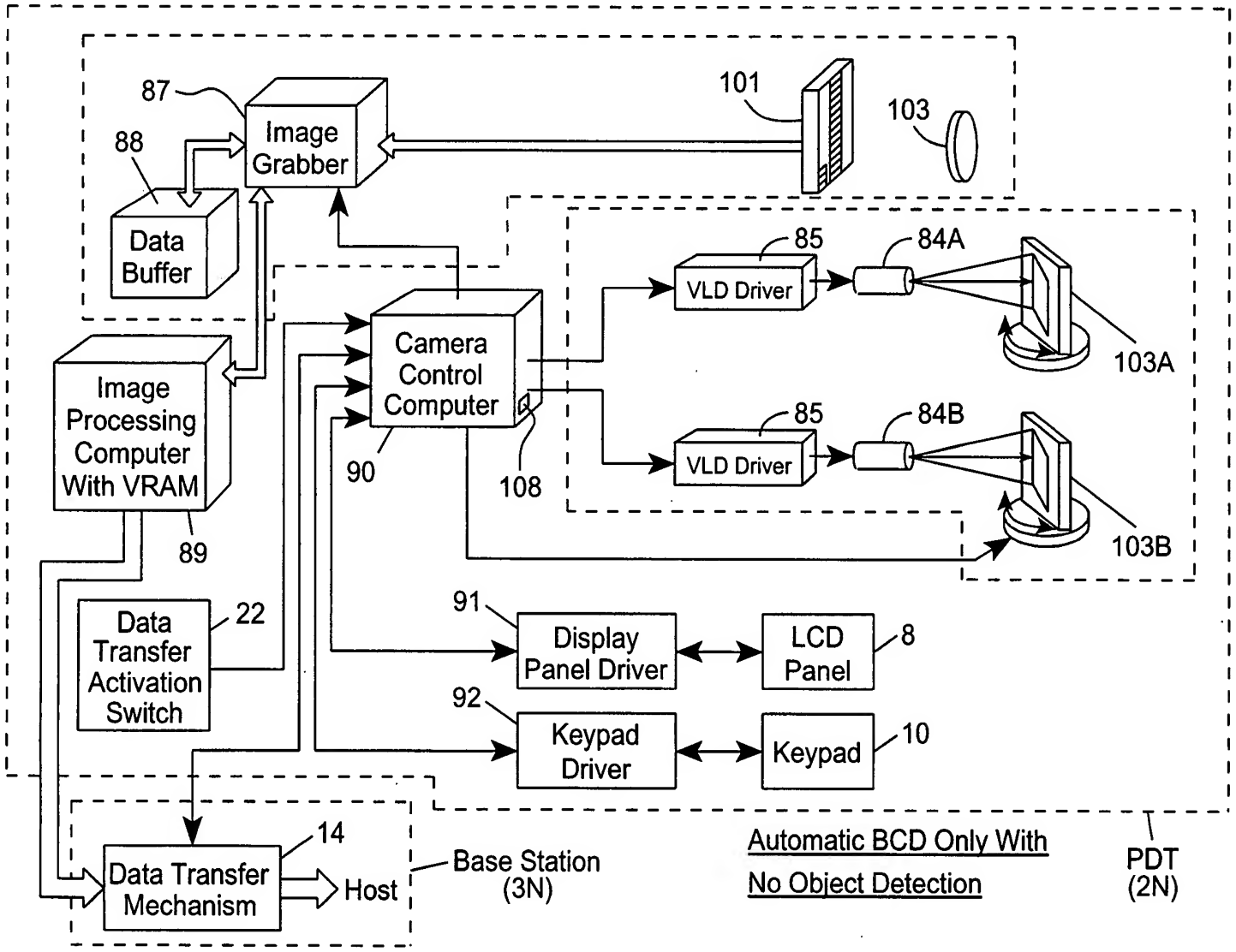
87
88
Image Grabber
101
103
Data Buffer
85
84A
VLD Driver
103A
Camera Control Computer
Image Processing Computer With VRAM
90
108
85
84B
VLD Driver
103B
89
Data Transfer Activation Switch
22
91
Display Panel Driver
LCD Panel
8
92
Keypad Driver
Keypad
10
14
Data Transfer Mechanism
Host
Base Station (3N)
Automatic BCD Only With No Object Detection
PDT (2N)

FIG. 15G

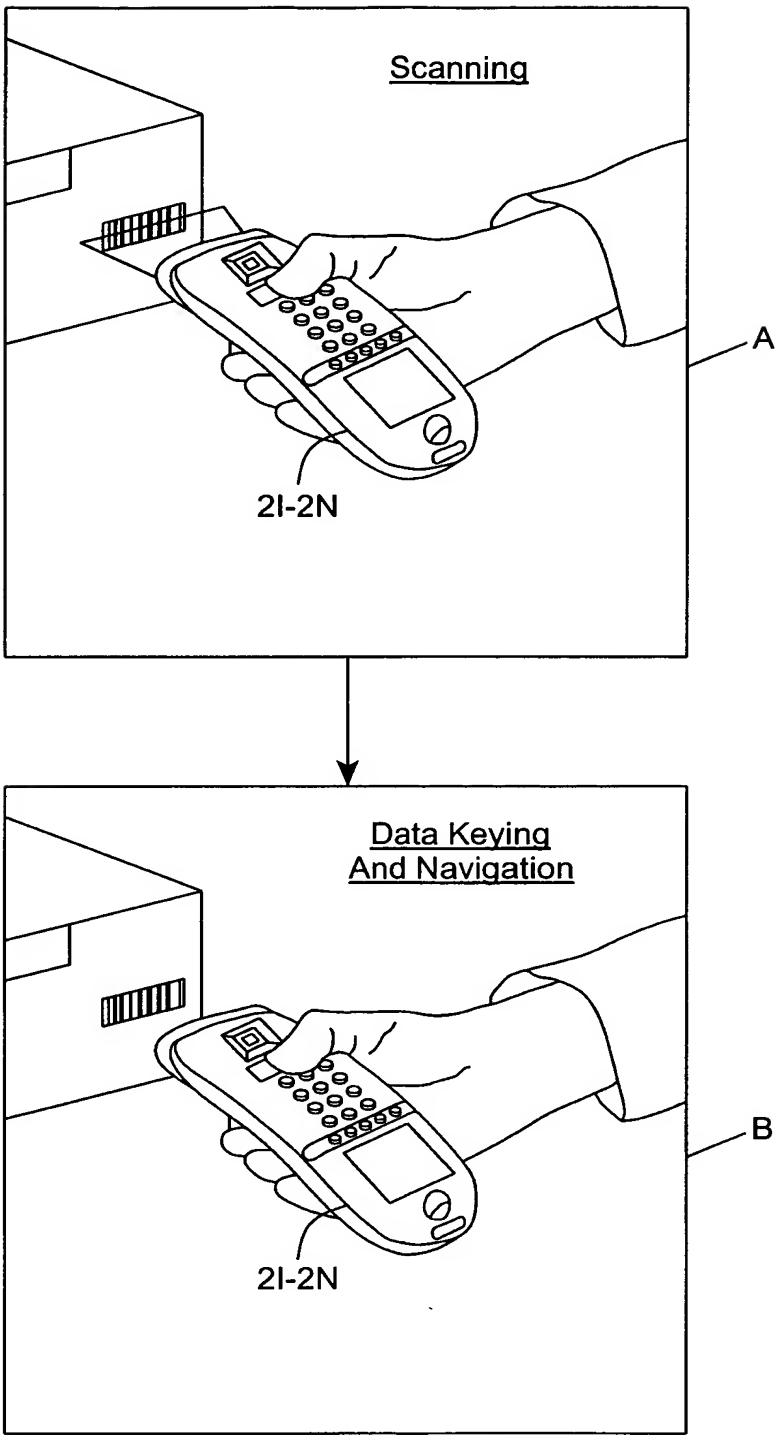

FIG. 15H